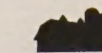


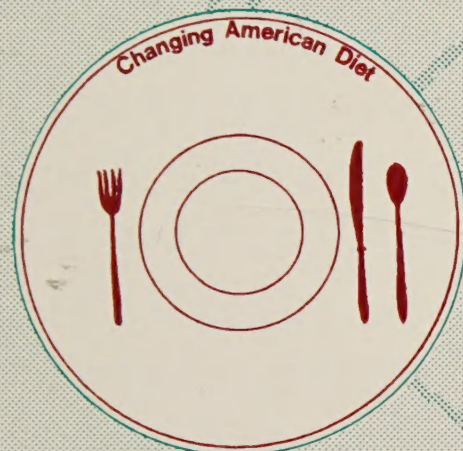
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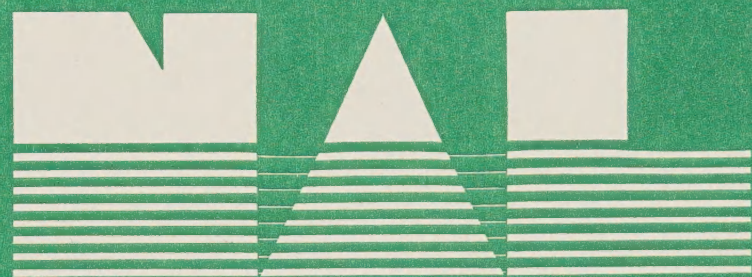
FORCES SHAPING U.S. AGRICULTURE

A BRIEFING BOOK



Prepared by the Economic Research Service, U.S. Department of Agriculture, July 1997

**United States
Department of
Agriculture**



National Agricultural Library

FORCES SHAPING U.S. AGRICULTURE: A BRIEFING BOOK

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CATALOGING PREP

This publication was designed and edited by ERS economist Todd Morath, based on briefings presented to USDA policymakers and senior management by Tom Carlin (farm structure and rural economy), Joy Harwood (U.S. agricultural policy), Dave Smallwood (the U.S. consumer), John Reilly (natural resources and environment, and agricultural research and technical change), and Nicole Ballenger (U.S. agricultural trade). Jane Allhouse, John Dunmore, Betsy Frazao, Lin Hoffman, Stephanie Mercier, Tim Osborn, and Judy Putnam made major contributions to developing the briefings. Many other ERS economists provided charts and data, and reviews and comments.

F O R E W O R D

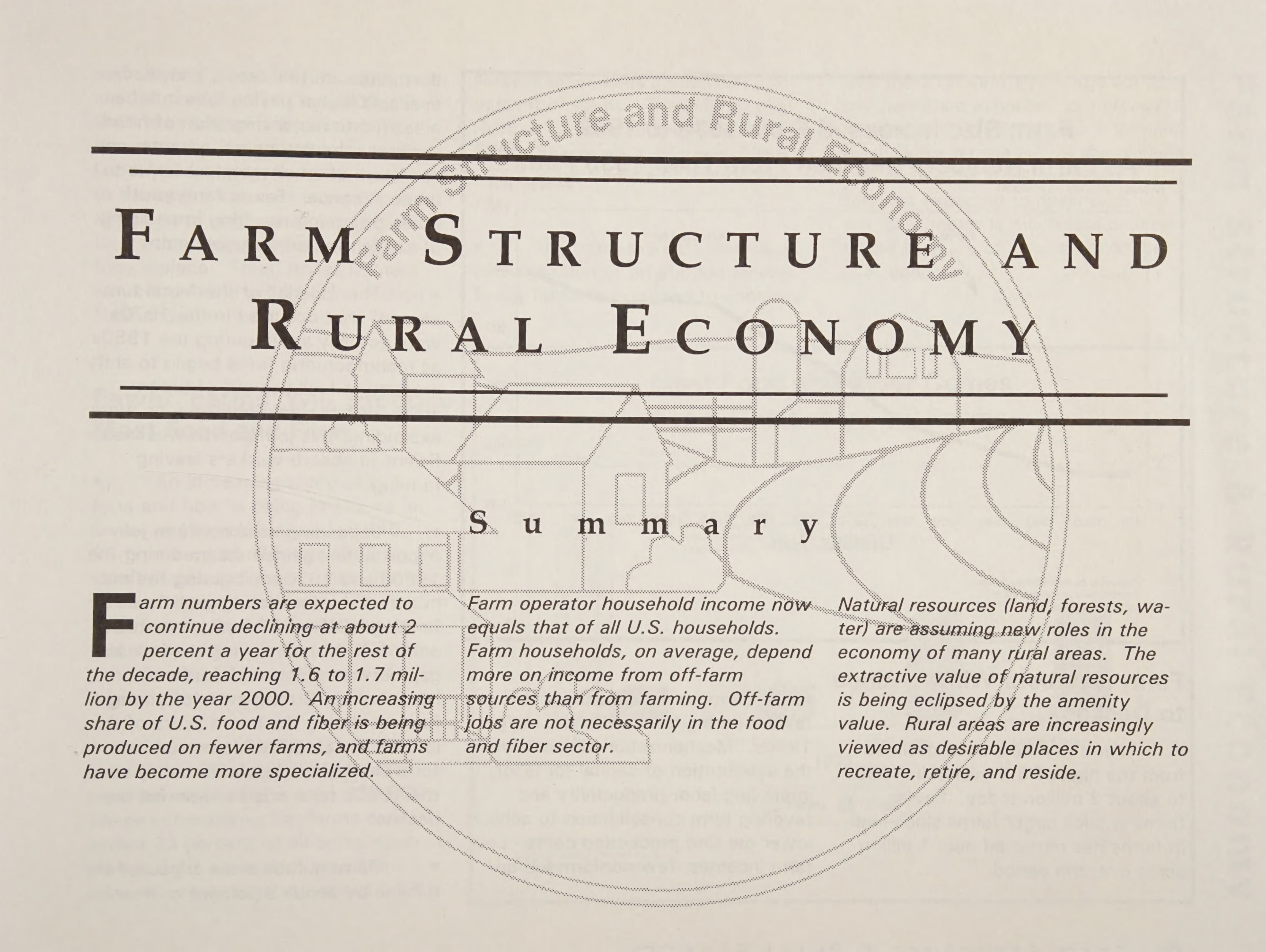
USDA's Economic Research Service welcomes the conferencees gathered in California for the 23rd meeting of the International Association of Agricultural Economists. This briefing book provides an overview of trends and conditions in the American food and agricultural sector, recognizing linkages and interdependencies with nations across the globe. Viewed as an agenda for disciplinary research, the topics covered in the book clearly transcend the traditional boundaries of "agricultural" economics. Farm level production issues remain of paramount importance in assessing food supply response, of course, but changing population demographics and market arrangements require analyses that probe complex determinants of food

demand and the means by which these preferences are revealed (or not) in global trading. Transboundary environmental issues are increasingly part of international political dialogue, and economists can help inform debate about appropriate policy intervention.

We enter the next century with a body of resilient and adaptable economic theory that has evolved over some 250 years. As applied economists, we will be among the first to know whether it also provides an analytical framework for understanding the challenges ahead. As the material in this book aptly demonstrates, there will be no shortage of questions to be answered. Will the world be able to feed itself while

protecting and conserving natural resources? Will new international trading arrangements promote market access and stability? How will the role of governments change? How can the goal of global food security be assured in new circumstances? The meeting in Sacramento provides an important opportunity for discussing the contributions our profession can make toward informing public and private decisionmaking. It is our hope that this briefing book contributes to the richness of that dialogue.

**Susan Offutt, Administrator
Economic Research Service
U.S. Department of Agriculture
July 1997**



FARM STRUCTURE AND RURAL ECONOMY

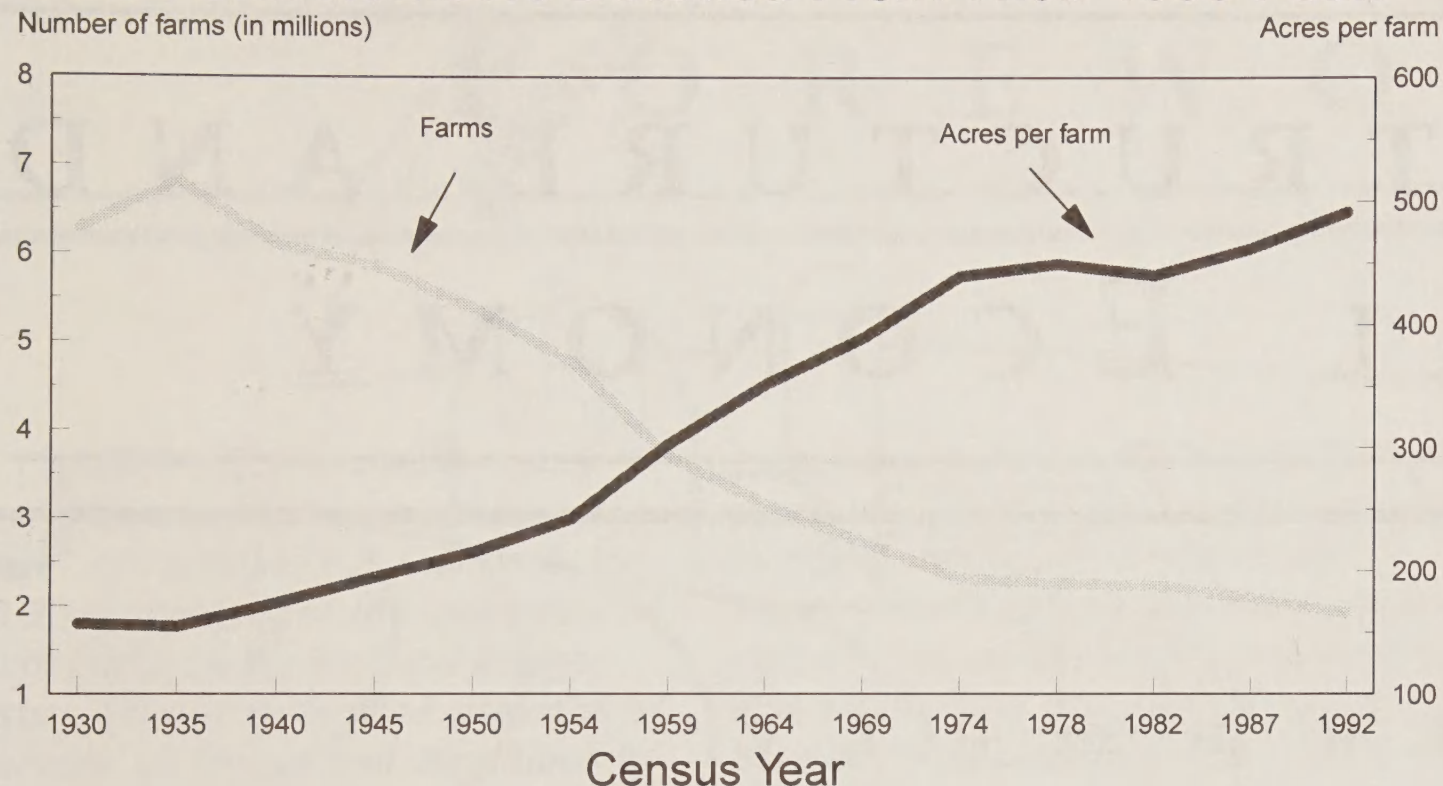
S u m m a r y

Farm numbers are expected to continue declining at about 2 percent a year for the rest of the decade, reaching 1.6 to 1.7 million by the year 2000. An increasing share of U.S. food and fiber is being produced on fewer farms, and farms have become more specialized.

Farm operator household income now equals that of all U.S. households. Farm households, on average, depend more on income from off-farm sources than from farming. Off-farm jobs are not necessarily in the food and fiber sector.

Natural resources (land, forests, water) are assuming new roles in the economy of many rural areas. The extractive value of natural resources is being eclipsed by the amenity value. Rural areas are increasingly viewed as desirable places in which to recreate, retire, and reside.

Farm Size Increased From 1930 to 1992 As Farm Numbers Declined From Their 1935 Peak



Prepared by the Rural Economy Division,
Economic Research Service, USDA,
using Census of Agriculture

Farm Numbers Will Continue to Decline

- Farm numbers have declined from the high of 6.5 million in 1935 to about 2 million today. Fewer farms implies larger farms since land in farms has remained near 1 billion acres over the period.

- Farm numbers declined the fastest during the 1950s and early 1960s. Mechanization allowed for the substitution of capital for labor, improving labor productivity and favoring farm consolidation to achieve lower per unit production costs. Low farm incomes, few nonfarm job op-

portunities in rural areas, and readily available higher paying jobs in urban areas led to major migration of hired workers, sharecroppers, tenants, and operators of small marginal farms to urban America. Fewer farm youth entered farming resulting in an aging of the farm operator population.

- The "seeds" of the "rural turn-around" that occurred in the 1970s were actually sown during the 1950s as manufacturing firms began to shift production facilities out of urban areas. While rural nonfarm jobs were expanding, this job growth was insufficient to absorb workers leaving farming.

- Expanding rural nonfarm job opportunities gained steam during the 1960s and 1970s mitigating the out migration by facilitating part time farming. Off-farm income eventually contributed to narrowing the income gap between farm and nonfarm households. Strong entry of young farmers during the boom years of the late 1970s stabilized farm numbers for a short time, but lower entry since the 1980s farm crisis continued the decline.

- Farm numbers are expected to decline by about 2 percent or less

annually for the rest of decade, reaching 1.6 to 1.7 million by 2000. The decline in farm numbers is not a threat to the Nation's food supply. Labor productivity on farms continues to increase. Younger farmers generally operate larger and more efficient farms than do older farmers whom they replace. Thus, fewer farmers can continue to produce the Nation's food and fiber.

Fewer Farms Will Produce Most Food and Fiber

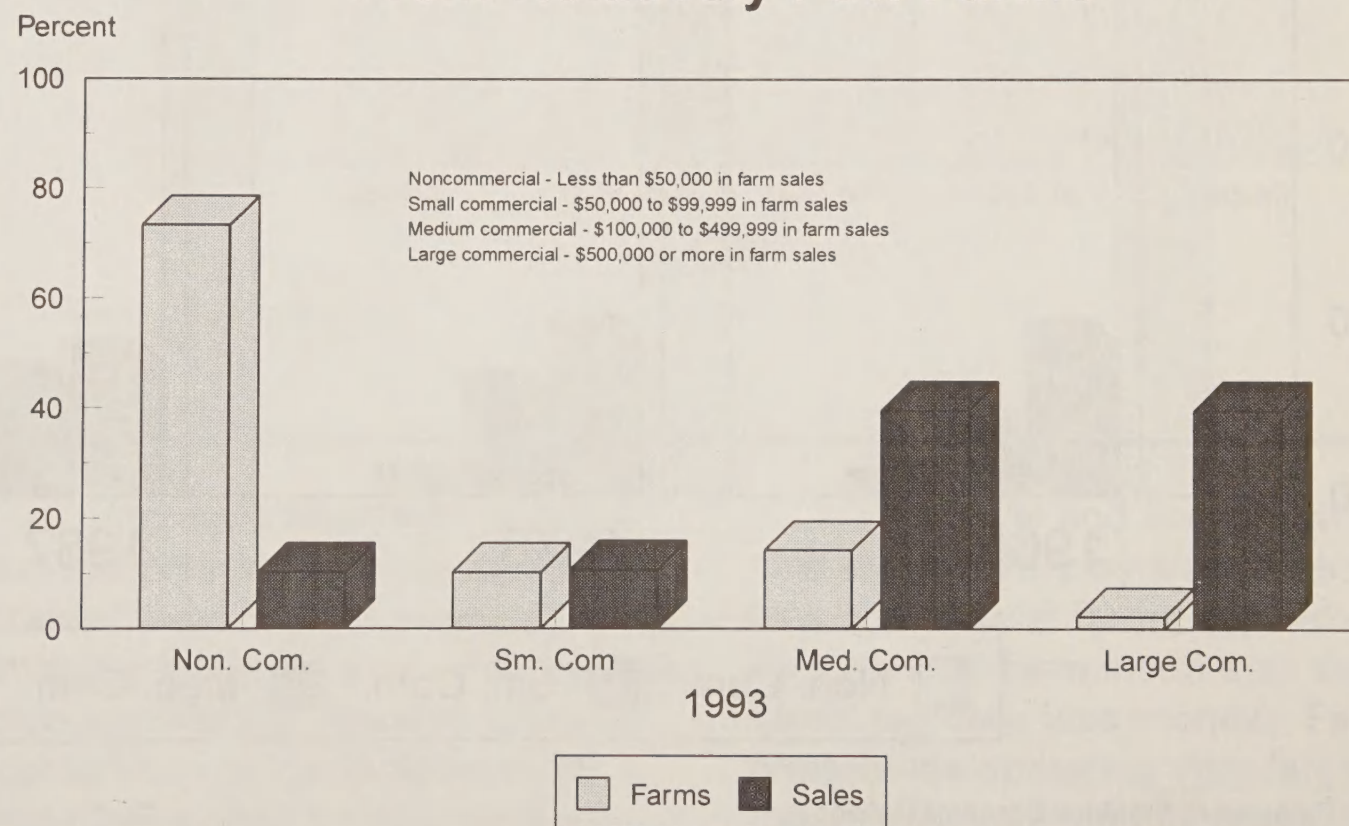
- An increasing share of U.S. food and fiber is being produced on fewer and fewer farms. In 1940, 11.6 percent of all farms (689 thousand) accounted for one-half of all sales of agricultural commodities from U.S. farms. By 1992, the proportion had dropped to 3.2 percent (62 thousand farms). [Source: Census of Agriculture]
- A recent profile of U.S. farms shows that 73 percent of all farms reported sales of less than \$50,000. These non-commercial farms controlled 33 percent of all acres operated and 10 percent of total farm sales. In sharp contrast, about 39.6

percent of all sales came from 2.2 percent of farms. These large commercial farms have annual sales of \$500,000 or more. [Source: 1993 USDA Farm Costs and Returns Survey]

- The trend towards increasing concentration of production among fewer farms is expected to continue

into the 21st century. Large commercial farms are expected to increase in number and will likely be 3.5 percent of all farms by the end of the decade. The number of small commercial farms is expected to decline. Still, the farm sector is much less concentrated than are other sectors of the U.S. economy.

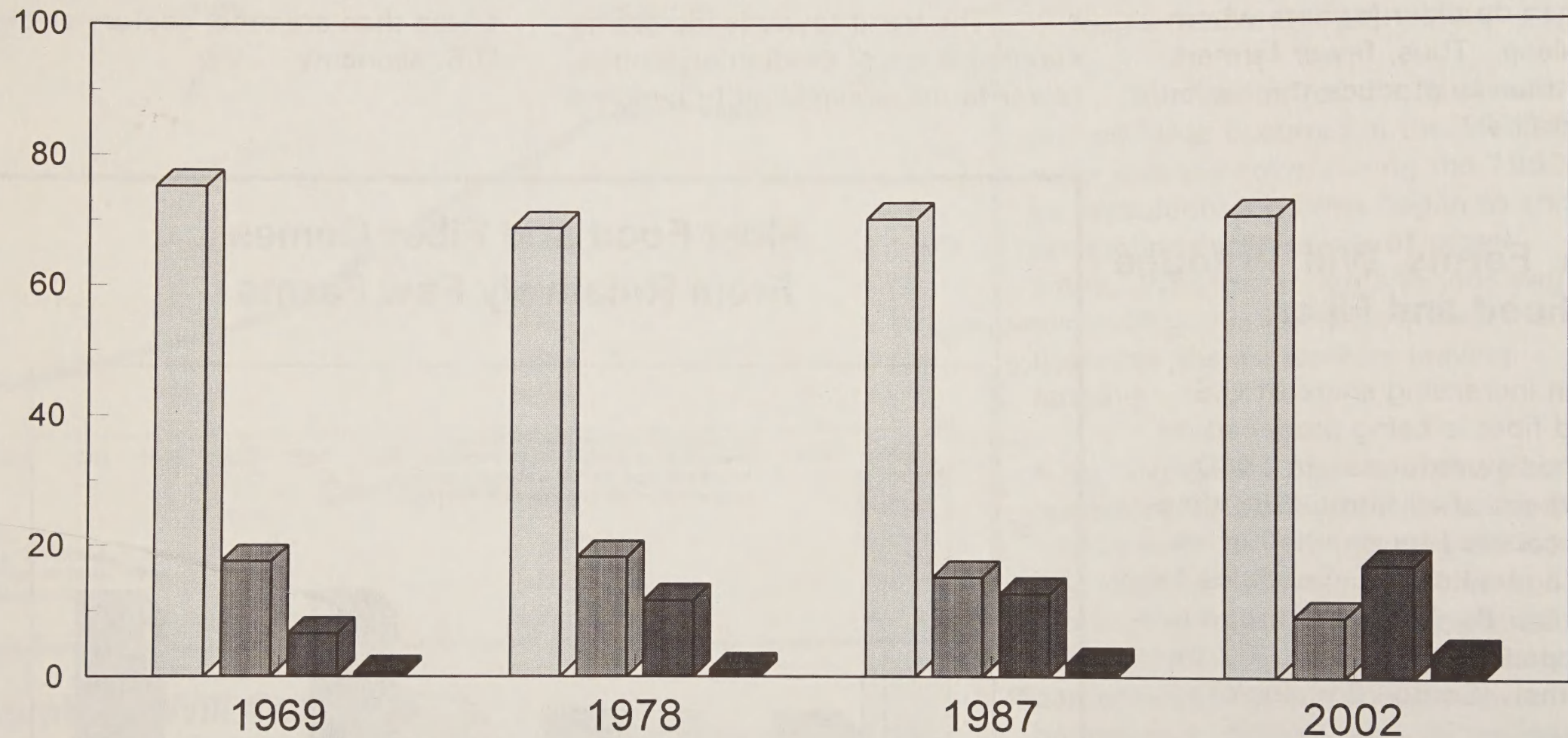
Most Food and Fiber Comes From Relatively Few Farms



Prepared by the Rural Economy Division,
Economic Research Service, USDA,
using 1993 Farm Costs and Returns Survey

Large Commercial Farms Expected to Increase

Percent of Farms



Non. Com. Sm. Com. Med. Com. Large Com.

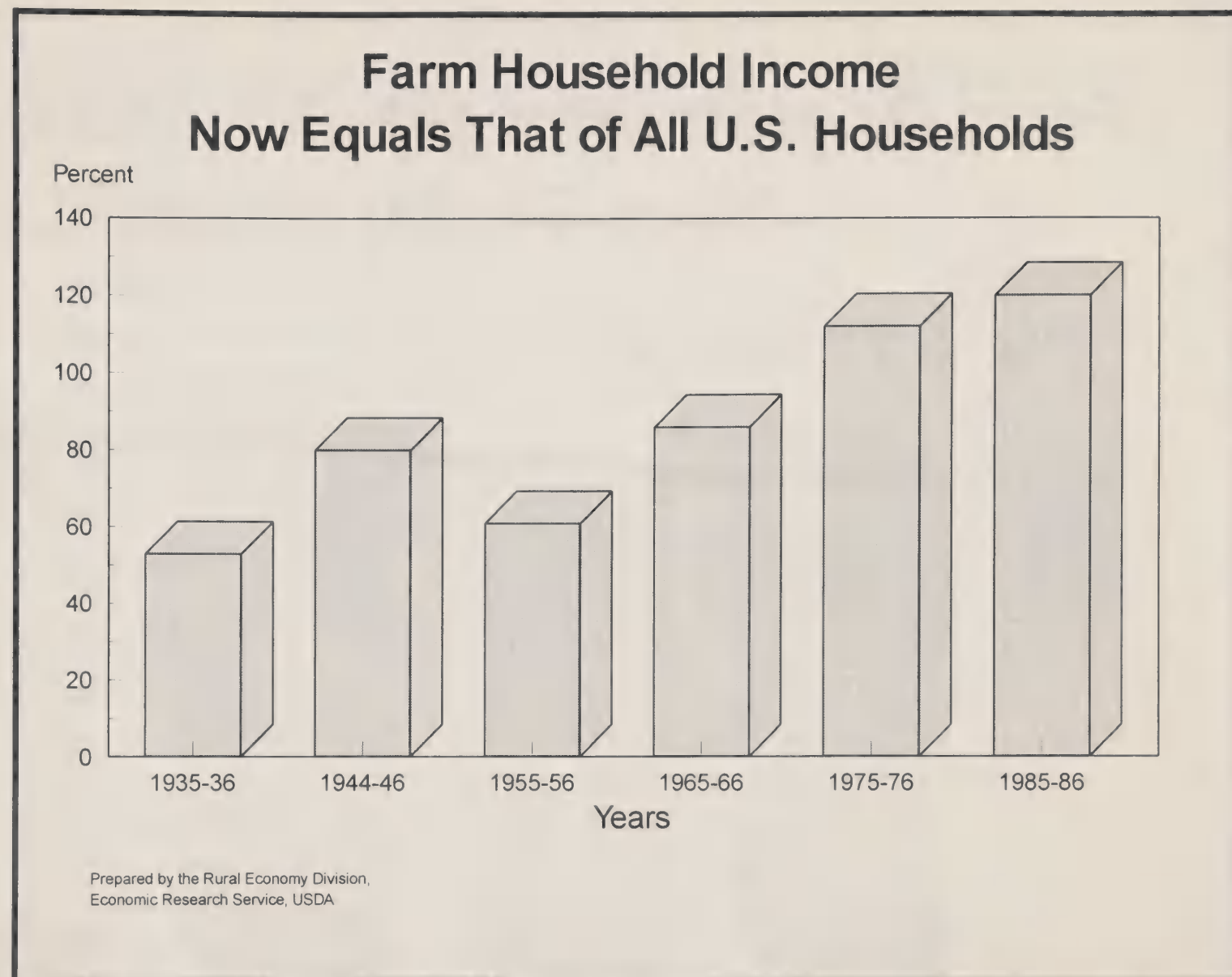
Prepared by the Rural Economy Division,
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- While smaller farms are becoming less significant as producers of food and fiber, they are still important players in environmental and land use policies because they control a major share of U.S. farmland.

Farm Household Income Matches National Average

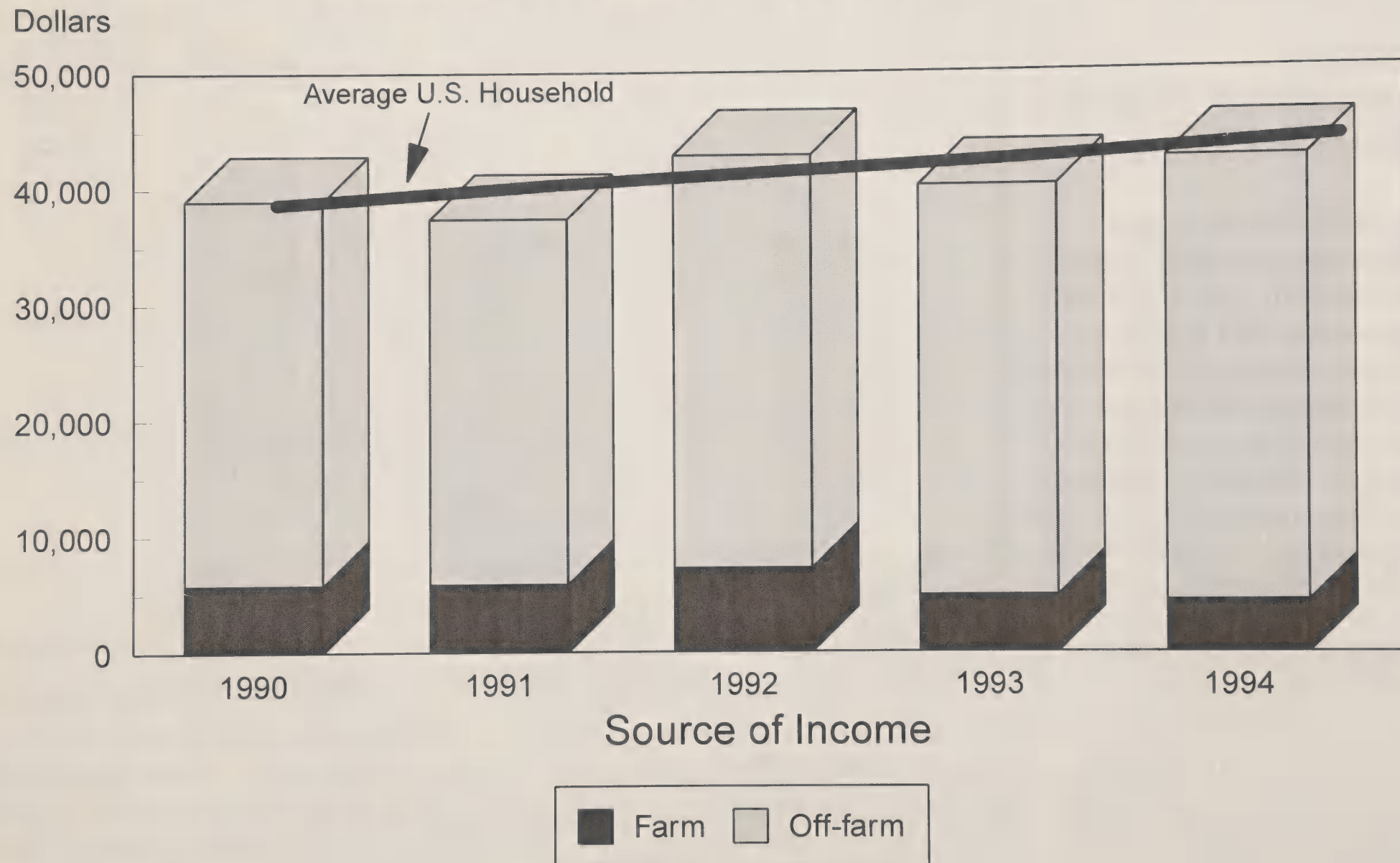
- Farm commodity programs were developed during a time when the average income of a farm household was about one-half that of all U.S. households. About 30 million people lived on farms in 1930, 24 percent of the total U.S. population and 56 percent of the rural population. Thus, efforts to raise farm family incomes would help ameliorate both U.S. and rural poverty.

- With the possible exception of the World War II period, this low relative income status persisted well into the 1960s. Farm households generally achieved income parity with all U.S. households during the 1970s and have remained that way, except for the early 1980s, ever since. Yet the general perception that farm families are relatively poor persists to this day.



- Improved access to rural non-farm jobs and income has played an important role in farm households achieving income parity. Farm households, on average, depend more on income from off-farm sources for family living than on income from farming. Farm households are not unlike the growing number of all U.S. households with two or more earners.
- The level and sources of household income vary by size of farm. Non-commercial farms depend exclusively on off-farm income as their farms typically lose money. Farm households operating very large farms report relatively high incomes, most of which comes from farming. The off-farm income of these households is also not dissimilar to that of most

Farm Operator Households and U.S. Households Have Similar Income Levels



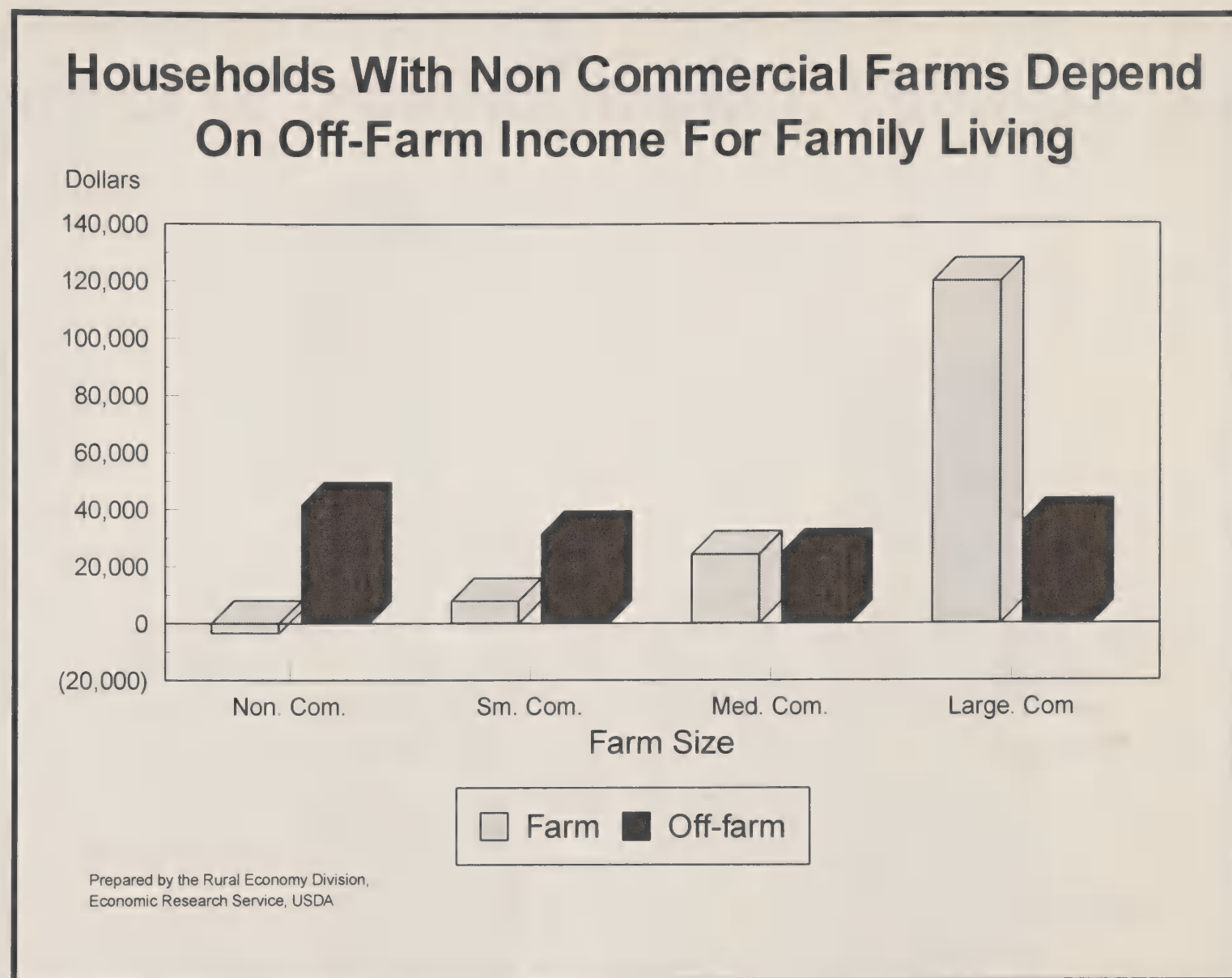
Prepared by the Rural Economy Division,
Economic Research Service, USDA,
using Farm Cost and Returns Survey and Current Population Survey

nonfarm households.

- The net worth of farm households exceeds that of all U.S. households. (\$334,900 for farm households versus \$99,800 for all U.S. households in 1993.) But farming is a capital intensive business which requires substantial assets in order to generate average U.S. household income.

Food and Fiber System Is Also Undergoing Structural Change

- There are about 21 million jobs in the U.S. economy (16 percent of all jobs) that involve growing, processing, and marketing the food that is consumed in the United States, exported to other countries, or imported from other countries. Jobs in farm production, agricultural inputs, and processing and marketing have declined in recent years. Job growth has occurred in wholesale/retail trade, the component of the system that is closest to the consumer.
- The number of food processing and food retailing establishments has declined over the last 30 years but the number of restaurants has in-



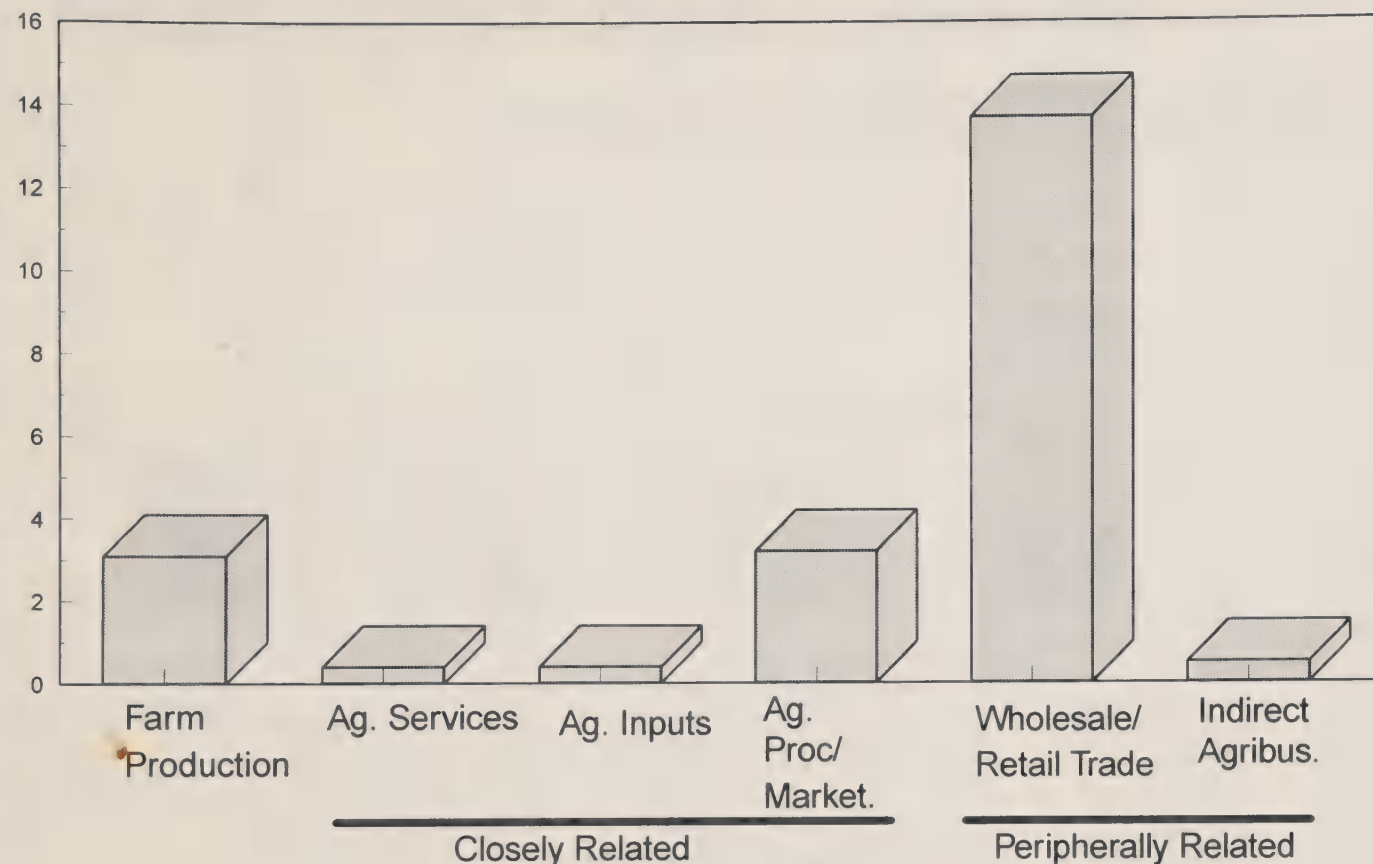
creased. This reflects consumers' increasing desire to eat away from home.

- Food processing establishments are increasing in size. The share of output supplied by all food processing plants with at least 500 employees increased from 28 percent in 1982 to 33 percent in 1992. Aggregate con-

centration is also increasing in the food processing industry. The share of sales accounted for by the top 20 firms increased from 23 percent in 1967 to 40 percent in 1987. But concentration varies widely among specific food processing industries. For example, the largest 4 firms account for only 24 percent of shipments in the ice cream and frozen

Farm and Farm-Related Employment, 1992

Million Jobs



Prepared by the Rural Economy Division,
Economic Research Service, USDA

desserts industry, while the top 4 firms in the cereal breakfast foods industry account for 85 percent of shipments.

- In food retailing, supermarkets now account for 76 percent of grocery store sales, up from 59 percent in 1963. Even within the supermarket category, there has been a rapid

shift to larger stores. Since 1980, the average size of supermarkets has increased from 23,000 to 35,000 square feet. Aggregate concentration in food retailing has been rising at a moderate rate. The share of sales accounted for by the top 20 food retailing firms increased from 34 percent in 1967 to 37 percent in 1987.

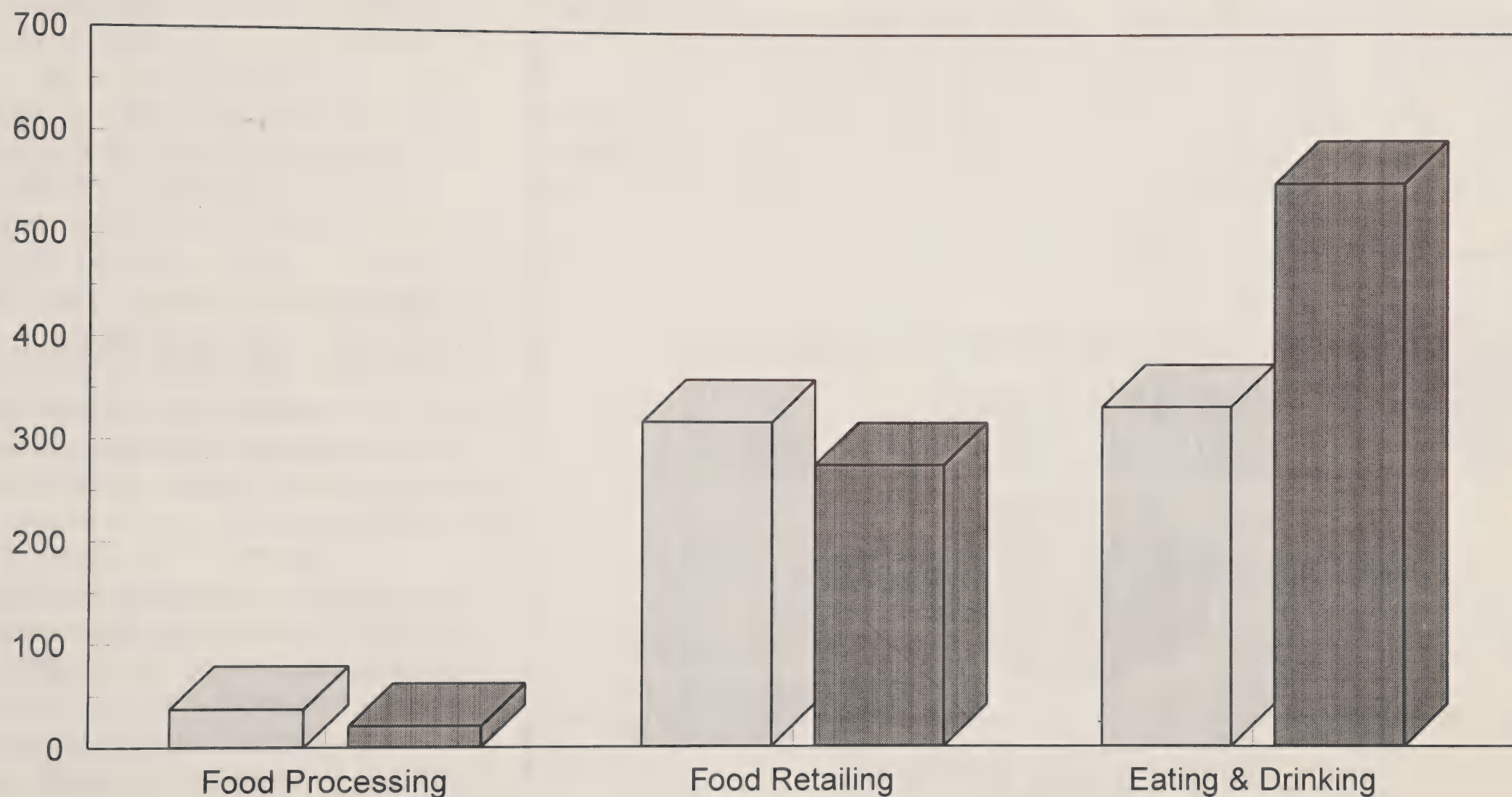
Farming No Longer Dominates Rural Economy

- The composition of the rural economy has changed since the inception of agricultural programs. Farming no longer dominates. This change can be illustrated in a variety of ways. In 1950, farming contributed 20 percent or more of total county earned income in over 2,000 U.S. counties. By the late 1980's, only 556 depended on farming for this level of earnings. These counties are geographically concentrated in the western Corn Belt and Plains States.

- Today's rural economies are more likely to be dominated by manufacturing, services, or government jobs than by jobs in farming. While farming provided over 14 percent of all rural jobs in 1969, that proportion dropped to about 7 percent by 1993. Recent job growth has occurred in the services sectors of the rural economy. Retirement and recreation activities are particular economic bright spots in the rural landscape. Many rural counties serve as residential areas for workers who commute to jobs in other counties.

Changes in Number of Establishments, 1963-92

1,000 Units



1963 1992

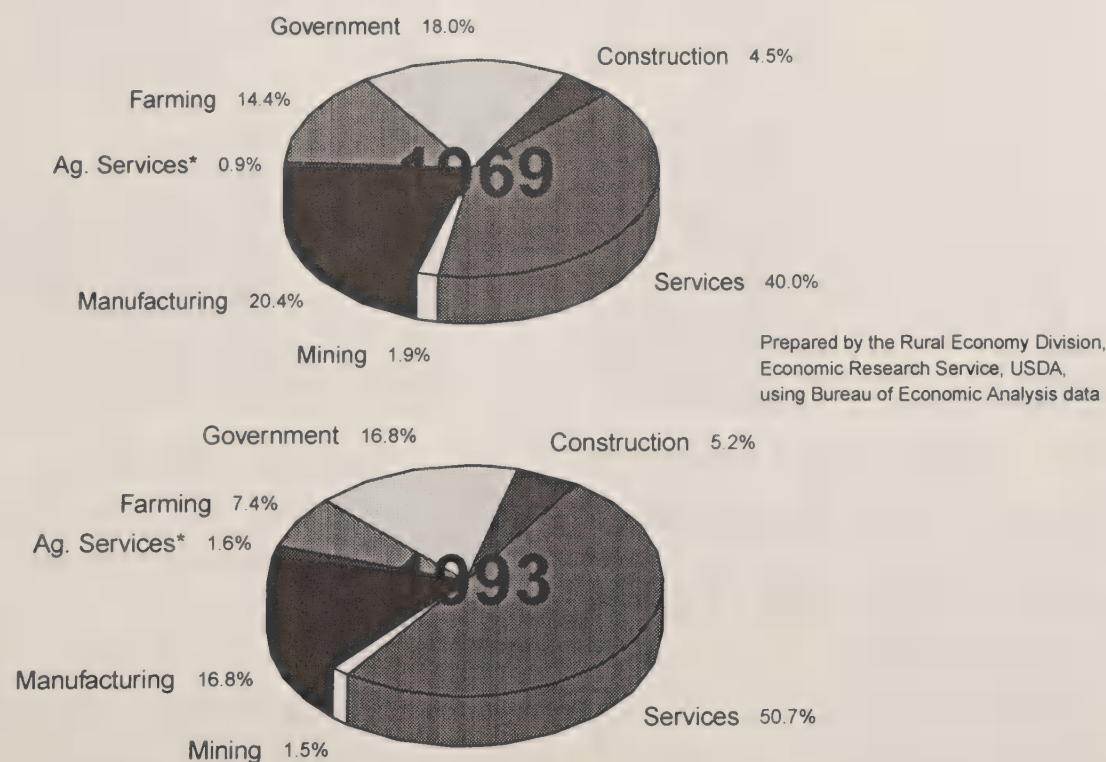
Prepared by the Rural Economy Division,
Economic Research Service, USDA

- Nor are rural jobs associated with the food and fiber sector, those industries associated with processing and marketing farm commodities or providing inputs to farm production. Only about 20 to 23 percent of rural jobs are associated with the food and fiber sector. With the exception of farming, food and fiber sector jobs are more likely to be located in U.S.

metropolitan areas, particularly jobs in wholesale and retail trade.

- Rural and small town areas exhibited a broad revival of population growth during the first half of the 1990's. Rural population rose 5.1 percent during 1990-95, nearly twice the rate of growth during the 1980's. About 1.3 million more people moved

Nonmetro Employment by Industry: 1969-1993



Suggested readings on characteristics of rural America...

USDA, Economic Research Service.
Understanding Rural America, Agriculture Information Bulletin 710, February 1995.

USDA, Economic Research Service.
Credit in Rural America, Agricultural Economic Report 749, April 1997.

...or visit the ERS Home Page briefing rooms on the following topics:

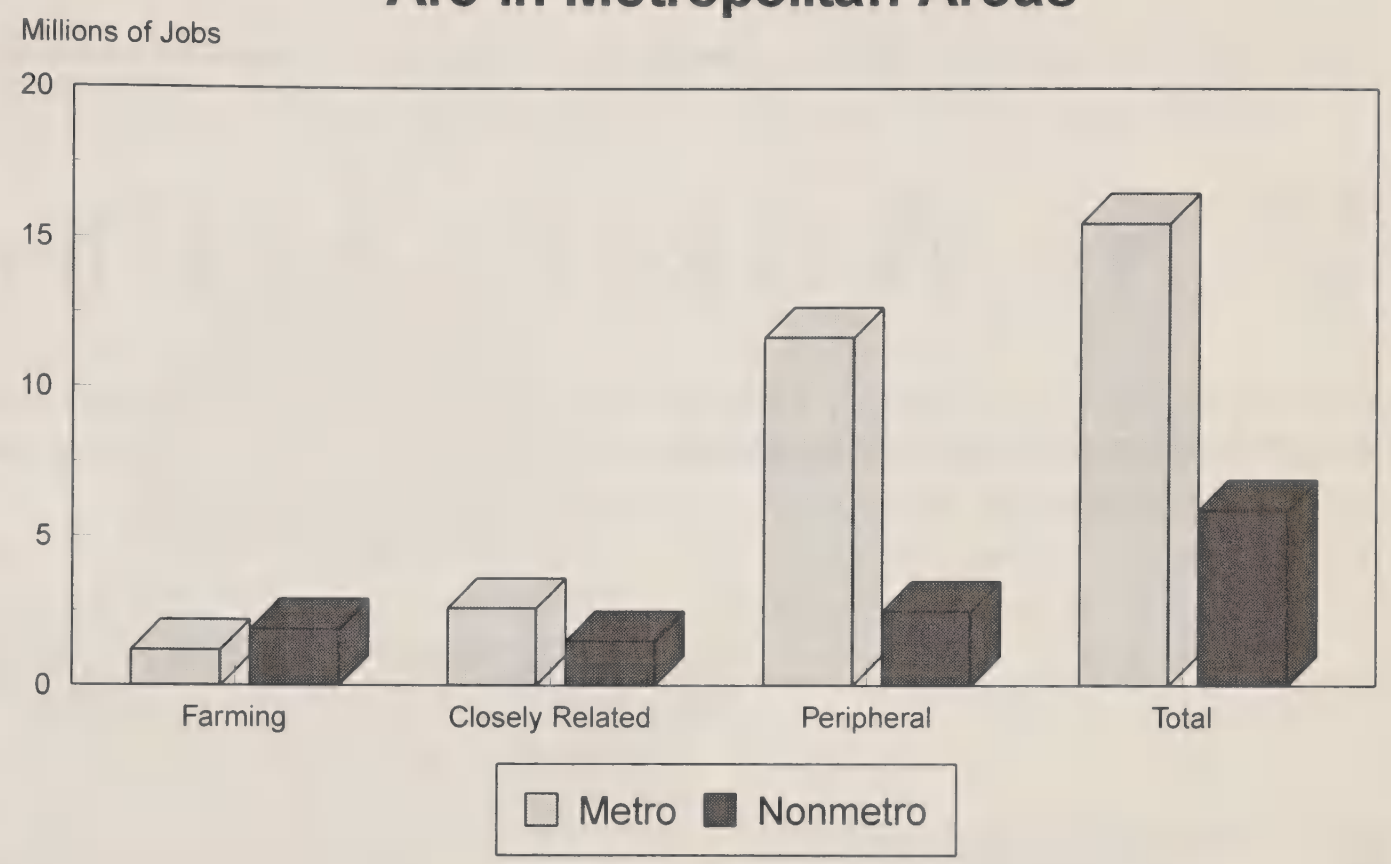
- Rural Economy at a Glance
- Farm Business Economics

at <http://www.econ.ag.gov/>

from metro America into rural and small town areas than moved in the opposite way -- a direction of net population flow contrary to that of any other time in the 20th century except for the 1970s and possibly the first half of the 1930s. During the 1980s, the net flow was in the opposite direction. Over 75 percent of nonmetro counties saw population growth in the 1990-95 period, up from 44 percent during the 1980s.

- Natural resources (land, timber, water) are performing a new role for many rural areas. Historically, natural resources have been important for their extractive value thereby providing jobs in farming, mining, and forestry products. But in the last two decades, the amenity value of natural resources has contributed to rural population and employment growth. For example, retirees are drawn to rural areas that are rich in scenic beauty and have a moderate climate thereby creating retirement-recreation based economies.

Most Farm-Related Jobs Are in Metropolitan Areas



Prepared by the Rural Economy Division,
Economic Research Service, USDA

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Farm Policy

U.S. AGRICULTURAL POLICY

S u m m a r y

U.S. farm policy has its roots in Depression era legislation of the 1930s when farm prices were depressed and farm income was significantly below income in the rest of the U.S. economy.

Over the decades, a series of legislative acts have revised the original farm programs to reflect the needs

and constraints of the times. The most recent farm policy act--the Federal Agricultural and Improvement Act of 1996--changed the role of government in agriculture, continuing the evolution away from intervention in markets and embracing the use of direct payments to producers.

The 1996 Act is likely to increase economic efficiency in U.S. agricul-

ture, but may also bring increased income variability and increased responsibility for producers to manage price and market risk. Business strategies to reduce risk could have implications for farm sector structure and could accelerate the trend in use of production and marketing contracts and other forms of vertical coordination in agriculture.

History of U.S. Farm Policy

- The 1933 Agricultural Adjustment Act (AAA) was a landmark piece of legislation in the history of American farm policy--a major break from previous legislation. Prior to 1933, "farm" legislation had the intent to provide greater opportunities in the agriculture sector.
- The 1933 AAA was designed to address the "farm problem"--low prices (supply surpluses); instability and uncertainty in farm prices and incomes; and low incomes in farm and rural communities. The 1933 AAA gave the U.S. government a new role in the management of the farm sector.
- The AAA and subsequent legislation introduced commodity programs which included production and marketing controls and price and income support programs for many of the most important farm commodities.
- Conditions in U.S. agriculture and the broader economic and policy environment have changed dramatically since the 1930s, but until the 1996 Federal Agricultural Improvement and Reform Act (1996 Act),

U.S. farm policy revolved around mechanisms that tied price and income supports to production controls.

Conditions Have Changed...

- In the early years of farm programs, roughly one-quarter of the U.S. population lived on farms. The current share of population living on farms is less than 2 percent.
- Yesterday's farms were diversified, but today they are often highly specialized. The proportion of farms producing any one commodity covered by farm programs has declined over time as a result of increased specialization of production. For example, in 1949, 1 in 5 farms produced cotton, compared to 2 percent in 1992. In 1949, 59 percent of all farms produced corn for grain compared to 26 percent in 1992. In 1949, 55 percent of all farms produced dairy products compared to 7 percent in 1992.
- Farm commodity programs were developed when the average income of farm households was about one-half that of all U.S. households. With the possible exception of the World War II period, this low relative

income status persisted well into the 1960s. Farm households generally achieved income parity with all U.S. households during the 1970s. The situation has remained that way, except for the early 1980s.

- Improved access to rural non-farm jobs and off-farm income has played an important role in farm households achieving income parity. As discussed in the first section of this briefing book, farm households, on average, depend more on income from off-farm sources for family living than on income from farming.

...Bringing Pressures for Policy Reform

- The changing structure of the U.S. agricultural sector and increasing dependence on world markets built pressure for reform in U.S. farm policy.

- Farm program rules constrained the most efficient producers in that their production decisions were tied to program parameters rather than to market prices. Additionally, program rules at times restricted the sector's ability to fully compete in the global market place. Acreage controls for some crops allowed competitors to expand.

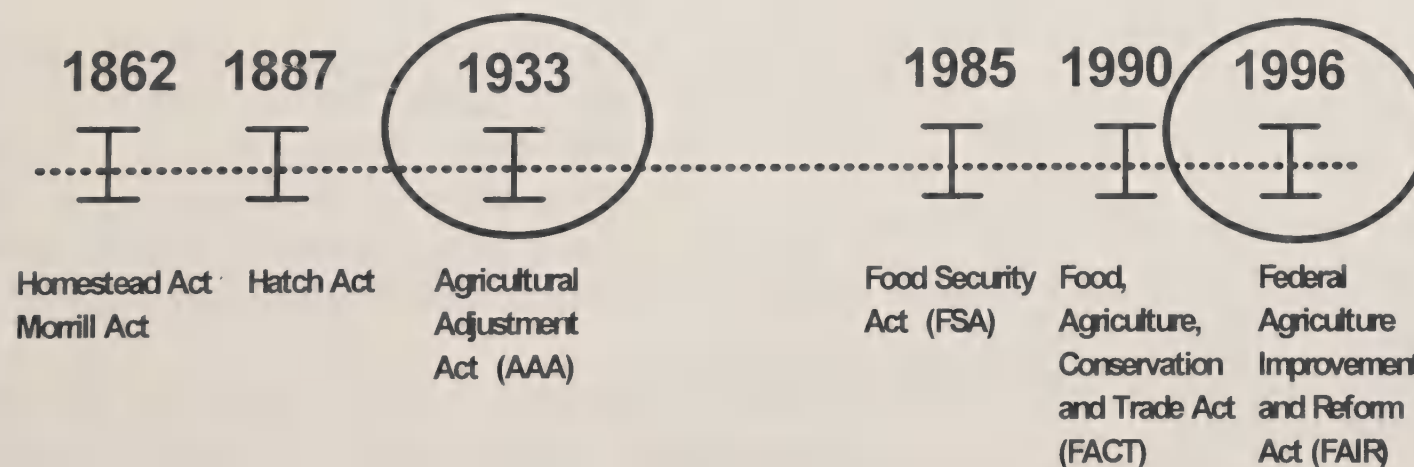
- Government expenditures for agriculture rose to peak levels in the late 1980s, which increased the Federal budget deficit and induced nonagricultural interests to become concerned with farm program costs.

Commodity Programs Managed Downside Risk for Producers

- The U.S. farm sector's dependence on government programs and payments has varied over time. One measure of the ebb and flow of the sector's dependence on farm programs is the level of direct government payments to producers as a percent of gross cash income.

- Dependence on direct government payments is not, however, the only measure of Federal support for the farm sector. Incomes were also protected by a system of price supports that kept prices at or above a set floor price--the government acting as a residual market adjustor and accumulating stocks under weak market conditions. Also, annual supply management programs required the idling of land--more land being idled under weak market condi-

U.S. Farm Policy



tions.

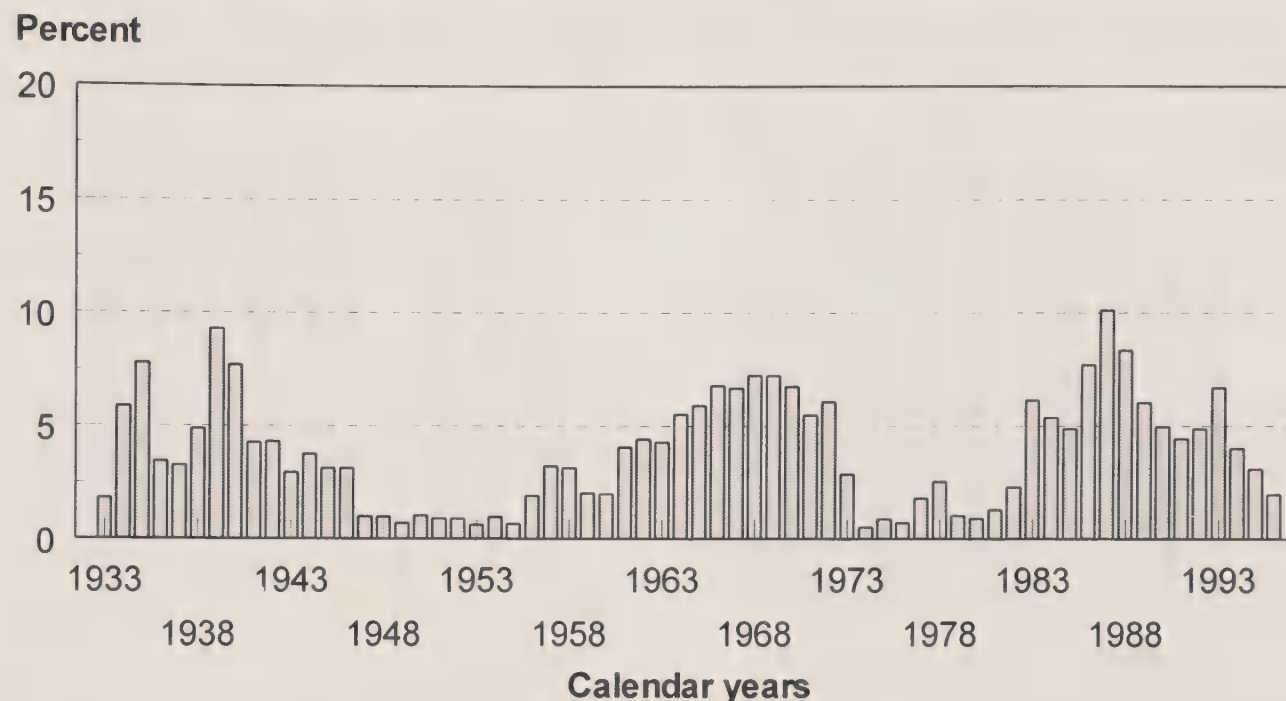
- Government payments over the 1933 to 1995 period ranged from 1 to 10 percent of gross cash income, as shown in the chart. The level, however, is not as important as the cyclical nature of the farm sector's dependence on government programs.

- Government payments were until 1996 linked countercyclically to market conditions. Under weak market conditions (low prices), government payments increased.

Government payments tended to fall when market demand was strong and prices high. Essentially, the federal government through the commodity programs managed the down-side market/price risk for producers.

- It is important to keep this countercyclical nature of government programs in mind. It becomes important later in understanding the implications of the 1996 Act.

U.S. Government Payments, as a Proportion of Gross Cash Income, Appear to Cycle Through Time



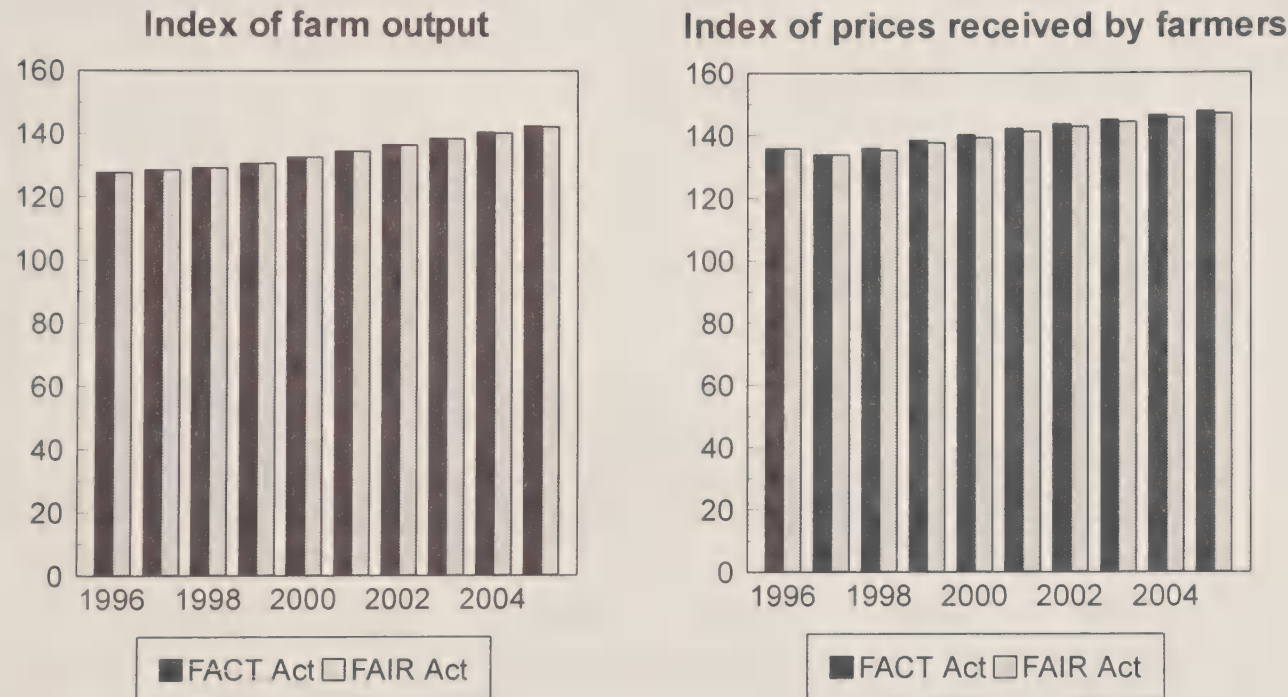
Represents direct government payments as a percent of total U.S. farm operator's gross cash income. 1996 is a forecast.

Regional Differences in Farm Program Dependence

- While direct government payments are 1 to 10 percent of gross cash income for the farm sector as a whole, they are more important in some regions than in others.

- In parts of the Southern Plains, the Western Corn Belt, and the Northern Plains, producers depend on government payments for 30 percent or more of their gross cash income. While many factors influence the dependence on government payments, the crop mix and the specialized nature of production, the size of the operation, and the degree of

Impact of Legislation on Output and Prices Is Minor



natural advantages (climate and soil productivity) are important determinants of dependency in these regions.

- The regional pattern of dependency on government payments, like the countercyclical pattern, is an important factor in understanding those areas likely to experience the greatest adjustment burden or pressure as a result of policy reform and

the implementation of the 1996 Act.

1996 Federal Agriculture Improvement and Reform (FAIR) Act

- The 1996 Act is another landmark in U.S. farm policy. First, it takes a major step toward phasing out

commodity programs that have been in existence, in some form, since the 1930's. Secondly, it takes the United States to an almost fully market-oriented farm policy.

- In the market orientation sense, the 1996 Act is more evolutionary than revolutionary. It completes the process that began with the two previous farm acts (1985 and 1990) of cutting the link between farm production decisions and government policy signals sent through traditional commodity programs. The 1996 Act completes the move to market orientation by: decoupling planting decisions from program parameters; eliminating annual supply control programs; and, most importantly, it no longer ties government payments to market conditions.

- Responsiveness to market forces will generate economic efficiency gains and make the sector more competitive in the global marketplace. As income variability increases, producers will need to take more responsibility for managing market and price risk.

Impact of Legislation on Output and Prices is Minor

- Projections from USDA and the Congressional Budget Office (CBO) suggest that levels of supply, demand, and prices for most commodities under the 1996 Act will differ little from the levels projected under a continuation of the old (1990) farm act.

- There are two major reasons for this finding. First, operator decisions, at least at the margin, were already being driven by market forces, more so than program parameters, following the 1990 farm legislation. Second, the next ten years point to bullish commodity markets based on expected strong export demand that helps offset government withdrawal of price and income support mechanisms (see trade section of this briefing book).

Farm Income Higher with 1996 Act Contract Payments

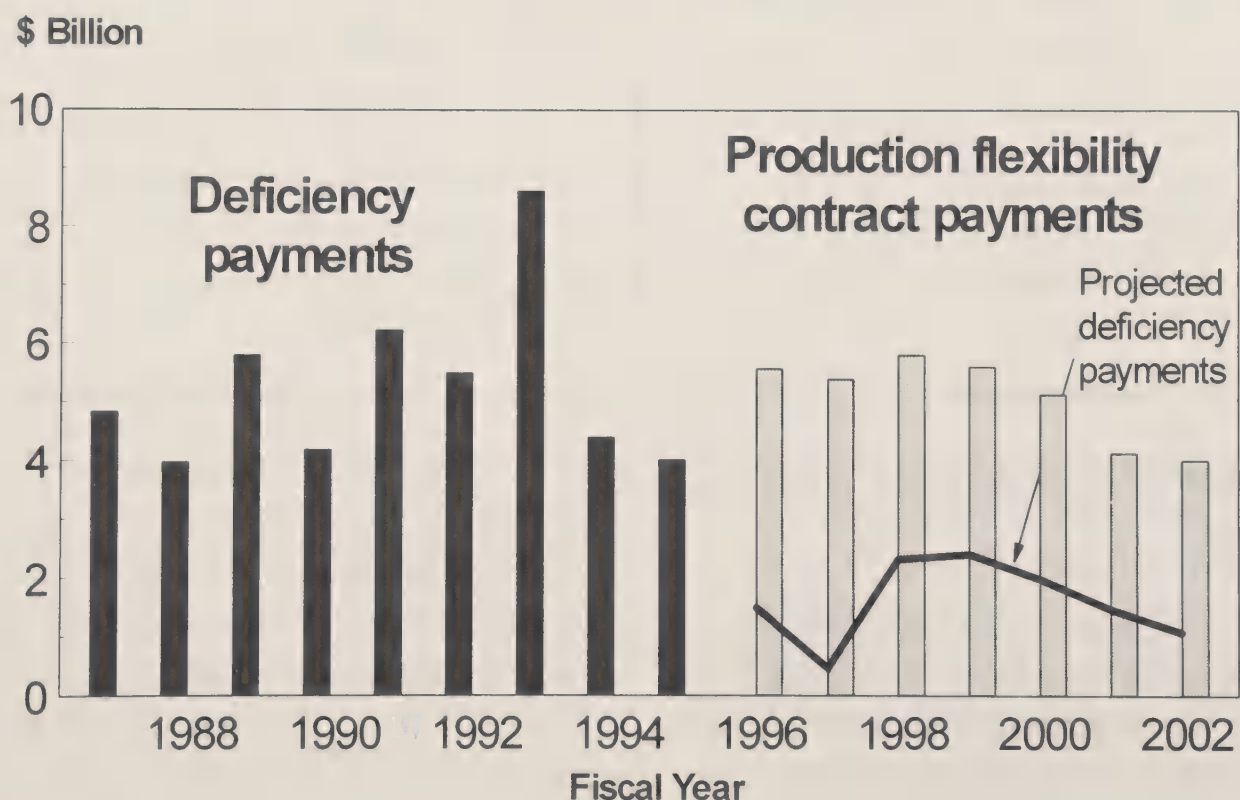
- Under a continuation of the provisions of the 1990 Act, direct government payments (called deficiency payments, projected at \$11 billion over 7 years) would have been substantially lower than the contract

payments called for under the 1996 Act (capped at slightly over \$36 billion over 7 years). So farm incomes (cash income from the market plus government payments) will likely be higher under the terms of the 1996 Act than they would have been under continuation of the old law.

- Phasing out of commodity

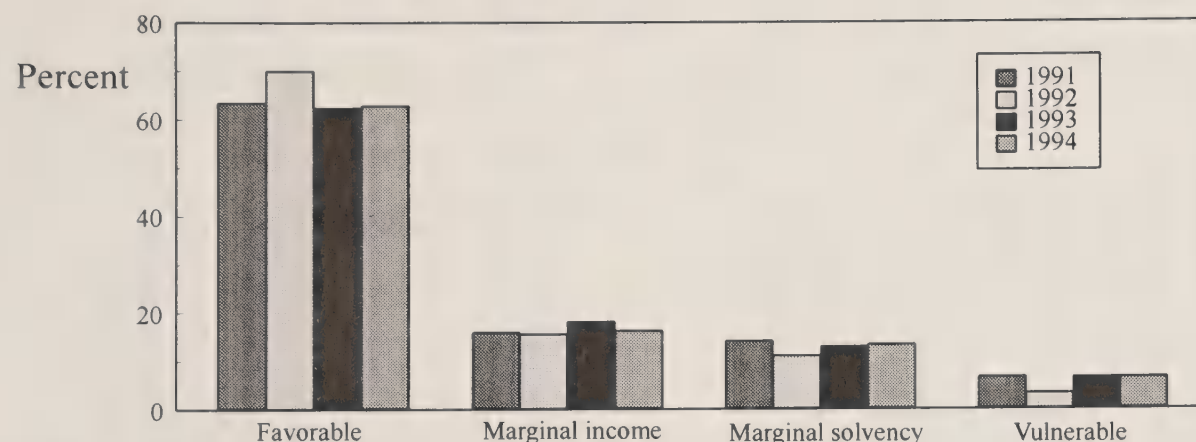
programs is not likely to lead to any large-scale displacement of farm operators on a sector-wide basis. First, contract payments will add to farm income and can be used by producers to facilitate whatever financial restructuring and rationalization that needs to take place. Secondly, the farm sector, in the aggregate, is currently financially sound.

Production Flexibility Contract Payments



Commercial Farm Financial Position

Most commercial farms that participate in government programs are not dependent on government payments (5 percent or less of gross farm income) and are in a strong financial position.



Even though payments do not represent a significant source of income, livestock farms are likely to be faced with transition issues given low incomes in 1994-95.

150,800 crop farms

Item	Dollars per farm
Gross farm income	\$230,237
Direct gov. payments	\$ 14,494
Net cash farm income	\$ 61,863
Net farm income	\$ 57,434

172,000 livestock farms

Item	Dollars per farm
Gross farm income	\$220,304
Direct gov. payments	\$ 8,360
Net cash farm income	\$ 37,659
Net farm income	\$ 24,375

Commercial Farm Financial Position

- Over 60 percent of commercial farms are in a favorable financial position and many of those farms are not dependent on government payments (payments account for 5 percent or less of gross farm income).

- Only 6 to 7 percent of commercial farms are classified in a vulnerable financial position, with a debt-to-asset ratio of 40 percent or greater. Consequently, little added displacement is expected to result from the 1996 Act.

Some Farms Under Pressure

- Reducing government influence on commodity production and marketing decisions means regions with natural comparative advantage--climate, soil productivity, alternative production possibilities, cost advantages, etc.--will be strengthened, but at the expense of "marginal" areas more dependent upon a "program advantage" than comparative advantage.
- Asset values, particularly land values, in marginal areas where values reflect existing commodity programs will drop. Areas with good productivity and cropping alternatives and less dependence on program returns could see asset values increase.

- Adjustment pressures will likely be greatest in the Northern Great Plains (wheat farms), the Western Corn Belt (mixed grain farms), and in the Southern Plains (wheat/cotton farms). There is a possibility of added stress in the Upper Midwest and the Northeast associated with reform in the dairy sector.

- The 34,000 farms identified as being most susceptible to financial restructuring have similar characteristics.

tics: moderate size farms with average gross cash incomes around \$100,000; government payments averaging over 30 percent of gross cash income; and a more vulnerable financial position (13 to 25 percent of these farms have a debt-to-asset ratio exceeding 40 percent).

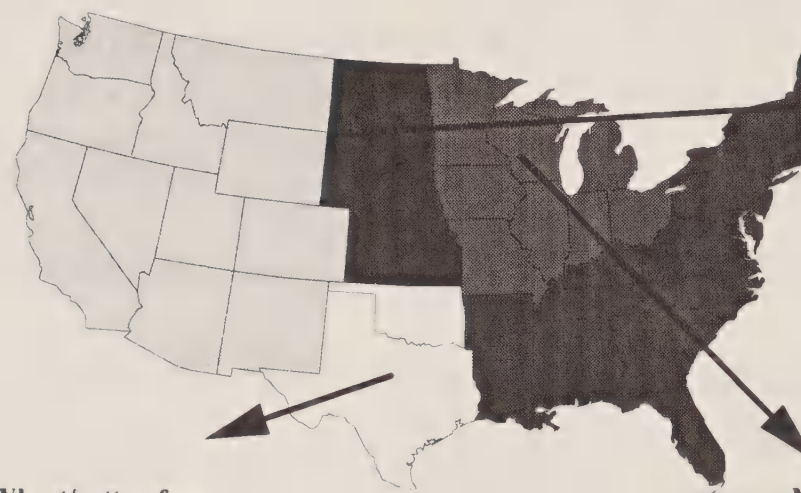
- Vulnerable regions could see an acceleration of farm consolidations and further concentration of production in a small number of large farms.

Market and Price Volatility Call for Risk Management Strategies

- Projected supply and demand conditions are based on "normal weather" and trend yield growth. In reality, we can expect to see continued commodity market volatility on the basis of year-to-year swings in domestic yields and export demand.
- Market and price volatility have been a hallmark of the agricultural sector. Under previous programs, the government played a large role in attempting to manage market/price risk in periods of weak demand--through various supply control and stockholding programs.

Farms Under Pressure

The financial transition will be greatest for 34,000 farms that are most dependent on government payments (20 percent or more of gross farm income).



Wheat farms

Moderate size farms with average gross cash income of \$90,000. Net farm income averaged \$15,000 during 1991-94. Off-farm income averaged \$21,908. Government payments averaged 34 percent of gross cash farm income. Thirteen percent have a debt/asset ratio of 40% or higher.

Crop sales the primary source of income with relatively small amount (8 percent) from livestock sales. On average, farmers own 800 acres of the 1,700 operated. Both cash and share rental arrangements have been used to expand operations. Fifty-six percent are age 55 year or older. Ninety-six percent consider farming their primary occupation.

Wheat/cotton farms

Moderate size farms with average gross cash income of \$110,000. Net farm income averaged \$25,000 during 1991-94. Off-farm income averaged \$32,200. Government payments averaged 36 percent of gross cash farm income. Twenty-five percent have a debt/asset ratio of 40% or higher.

Crop sales the primary source of income with relatively small amount (8 percent) from livestock sales. On average, farmers own 440 acres of the 1,600 operated. Both cash and share rental arrangements have been used to expand operations. Fifty-five percent are age 55 year or older. Eighty-eight percent consider farming their primary occupation.

Mixed grain farms

Moderate size farms with average gross cash income of \$103,000. Net farm income averaged \$4,500 during 1991-94. Off-farm income averaged \$23,076. Government payments averaged 30 percent of gross cash farm income. Sixteen percent have a debt/asset ratio of 40% or higher.

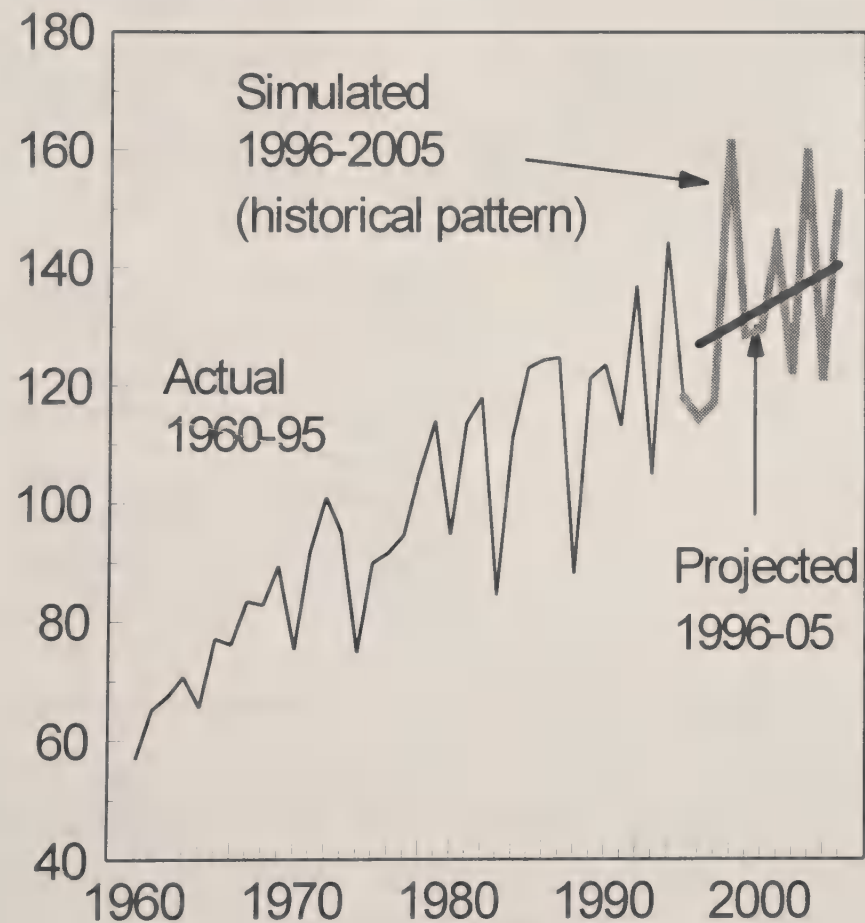
Crop sales the primary source of income with relatively small amount (9 percent) from livestock sales. On average, farmers own 200 acres of the 650 operated. Both cash and share rental arrangements have been used to expand operations. Twenty-four percent are age 55 year or older. Ninety-one percent consider farming their primary occupation.

- The 1996 legislation allows changes in market prices--not government programs--to "equilibrate" supply and demand. Will commodity prices be more volatile under the 1996 Act? Empirically, we don't know. But, cash farm income could be more volatile.
- U.S. producers are already using many market risk management strategies. Producers are more often using strategies such as keeping equity in cash and current assets, buying crop insurance, and spreading sales over the year than they are hedging in futures markets.

Corn Yields and Export Variability

Corn yields

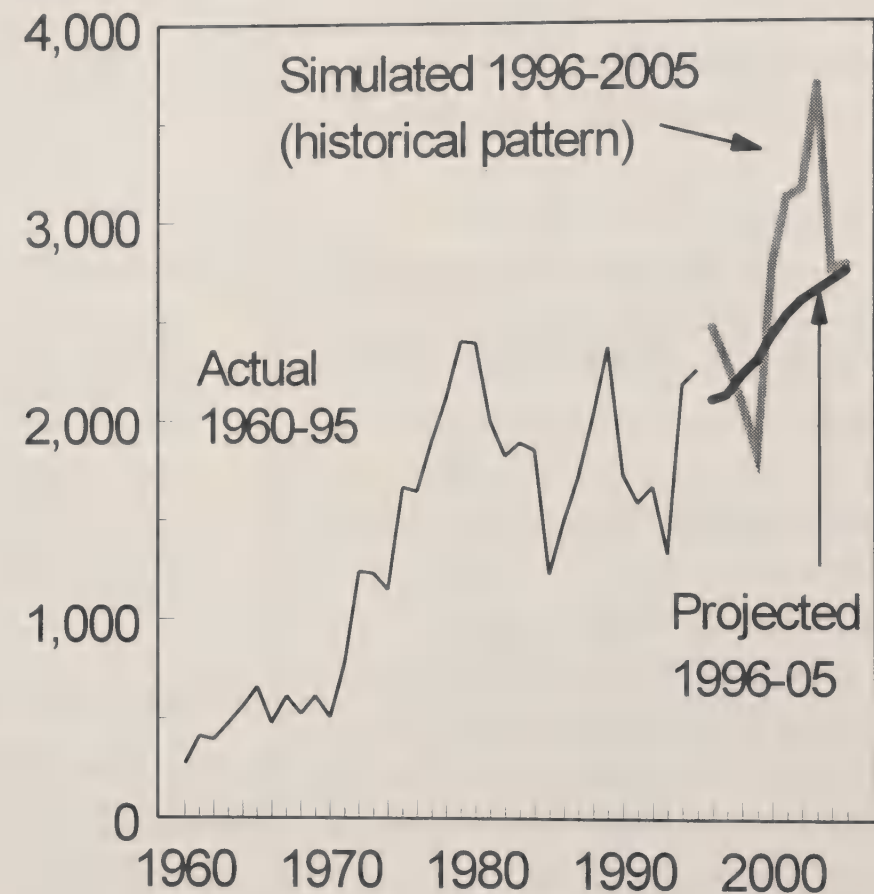
Bushels/acre



Baseline yield projections assume normal weather conditions throughout period.

Corn exports

Million bushels



Policy changes, political upheaval, or widespread crop failure could shift export demand in any given year.

- How do size and ability to manage risk interact? Smaller enterprises with a greater dependence on off-farm income are in a stronger position to weather increased market volatility and income swings. Larger diversified operations are in a strong position to take advantage of production, marketing, and financial strategies to manage risk. Many of these larger farms, less dependent on government payments, are those already using a wide array of risk management strategies.

- The medium size farms (smaller commercial farms), appear to be the enterprises most in need of timely market information and a research and education program designed to identify alternative risk management strategies and to improve risk management skills. The 1996 Act essentially places a premium on management and the use of information to control costs and improve financial performance of farm operations

Risk Sharing via Production and Marketing Contracts is Increasing

- The issue of price and income volatility and managing market risk goes beyond the farm gate to the food marketing system.

- Agribusiness has strong interest in dependable supplies, stable prices and constant margins rather than more volatile prices. Agribusiness is likely to join producers in search for risk management options.

- In food industries not covered by previous farm programs, such as livestock and horticultural products,

Use of Risk Management Strategies, 1994

	Commercial farms				
		Program participants			
	All farms	All commercial farms	All participants	More than 10% gross cash income from payments	More than 20% gross cash income from payments
	Percent				
Hedge or use futures markets	11	26	35	34	29
Contract crop/livestock sales	20	48	57	55	57
Spread sales over year	39	67	75	76	68
Forward price inputs	16	42	53	58	57
Keep unused borrowing capacity/Open credit line	35	66	74	72	68
Keep equity in cash & current assets	54	80	84	81	75
Produce stable or low-variability income commodities	28	50	57	56	47
Government program participation	42	71	94	96	96
Purchase crop or livestock insurance	40	71	85	46	46

Source: 1994 Farm Costs and Returns Survey

Risk Sharing Via Contracts Is Low, But Increasing For Field Crops

Output under production and marketing contracts

Commodity	1970	1994
Field Crops		
Food grains	2	8
Feed grains	<1	13
Cotton	11	20
Livestock		
Broilers	92	92
Turkeys	60	65
Fluid grade milk	95	95
Hogs	1	13
Fed cattle	18	11
Specialty Crops		
Processed vogs.	85	88
Fresh vogs.	21	25
Potatoes	45	55
Citrus	84	88

risk sharing via production and marketing contracts has been a major risk management strategy.

- Output under production and marketing contracts for field crops is low, but increasing. The 1996 Act could accelerate that trend in use of production and marketing contracts and other forms of "vertical coordina-

tion" for field crops. Consequently, business strategies to reduce risk could have structural and vertical coordination implications.

Suggested readings on risk management in U.S. agriculture...

Harwood, Joy, Dick Heifner, Keith Coble, and Janet Perry. "Strategies for a New Risk Management Environment," *Agricultural Outlook*, USDA, Economic Research Service, October 1996.

...and suggested readings on U.S. agricultural policy reform:

Nelson, Frederick J., and Lyle P. Schertz, eds. *Provisions of the Federal Agriculture Improvement and Reform Act of 1996*, AIB-729, USDA, Economic Research Service, September 1996.

Young, C. Edwin, and Paul C. Westcott. *The 1996 U.S. Farm Act Increases Market Orientation*, AIB-726, USDA, Economic Research Service, August 1996.

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THE CHANGING AMERICAN DIET: TRENDS AND ISSUES

S u m m a r y

The American diet has undergone vast changes in terms of what, where, and why Americans eat and how much they choose to spend. Powerful and complex forces drive consumption patterns. Food choices are not simple and reflect the balancing of one factor against another. These include income, prices, tastes, quality, convenience, nutrition, and safety. When changing factors work together, the results are obvious. However, this is seldom the case with food.

When compared with federal dietary recommendations depicted in the

USDA Food Guide Pyramid, the healthfulness of the American diet has shown modest improvements since 1970. Americans, on average, increased their consumption of fruits, vegetables, grains, meat and dairy products between 1970 and 1995. At the same time, consumption of added sugars and fats, nutrients that tend to be over consumed, has increased.

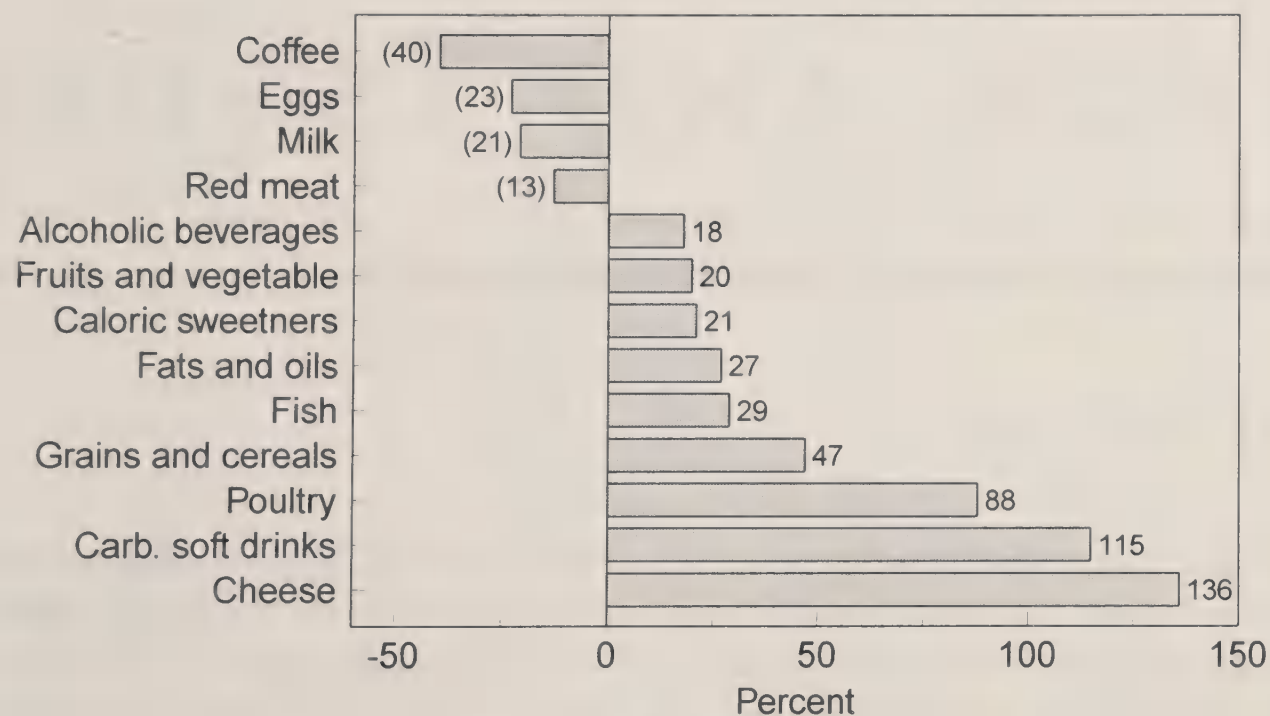
Despite some improvements, most consumers continue to fall short of Food Guide Pyramid serving recommendations for fruits, vegetables, and

dairy products while consuming excess servings of the added fats and oils and added sugars depicted at the top of the Food Guide Pyramid.

Movement toward the dietary guidelines implies fundamental changes in what is produced and how it is produced, processed and marketed. These changes will have impacts on the environment, on water quality, on fertilizer usage, on farm equipment manufactures, retailers, wholesalers, and everyone in between. Agricultural research will be a key conduit for channeling and understanding these changes. As Americans improve their

Changes in Per Capita Consumption, 1970-94

The American diet undergoes marked changes



diets and, hence their health, a vast potential exists for containing health care costs, improving longevity, and enhancing productivity.

A challenge for the coming century is to integrate agricultural, food, nutrition, economic, and medical research to enhance product development productivity, improve communication so

that all people can share in the benefits of better diets, maintain a safe affordable food supply, and understand developing trends and use them to our advantage.

Trends in Per Capita Food Consumption

- The American diet has changed considerably over the last quarter century. Changes have been driven by various factors, including prices, consumer income, convenience, new products, growth in the away-from-home food market, expanded advertising programs, smaller households, more two-earner households, more single-parent households, increased ethnic diversity, and a burgeoning interest in nutrition.

- Consistent with dietary and health recommendations, Americans now consume nearly one and a half times more grain products and a fifth more fruits and vegetables on a per capita basis than they did in 1970. Contrary to recommendations, however, Americans are consuming record-high amounts of caloric sweeteners, carbonated soft drinks, frozen dairy desserts, and candy.

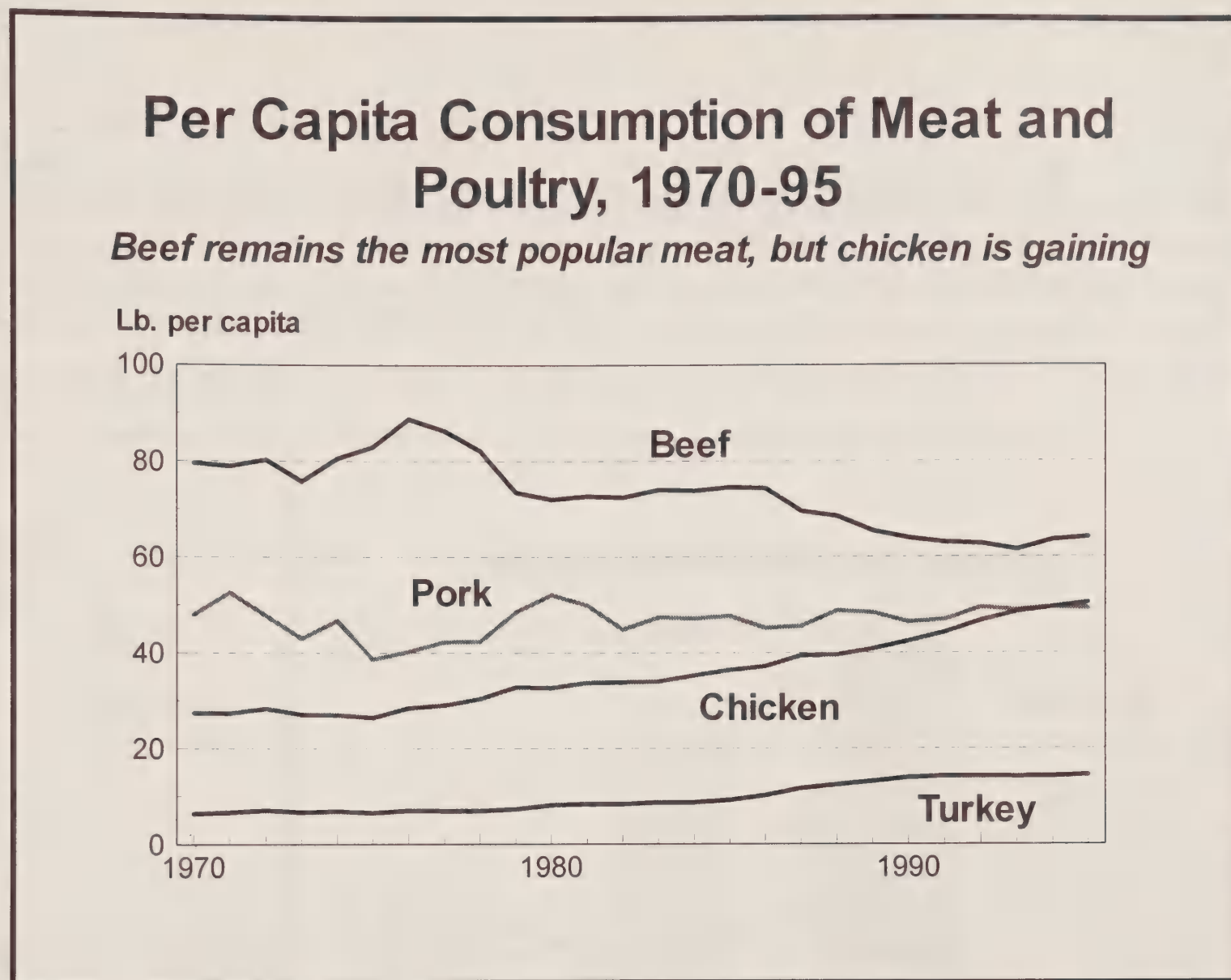
More Than Ever A Nation Of Meat Eaters

- In 1995, total meat consumption (red meat, poultry, and fish) reached a record 195 pounds (boneless equivalent) per person, 16

pounds above the 1980-84 annual average. "Value-priced" burgers and buckets of fried chicken draw customers to food service outlets. Rotisserie chicken and "buffalo wings" have become so popular that they have made inroads across the country, even in pizzerias.

- Per capita consumption of beef reached an all-time high of 89 pounds (boneless, trimmed equivalent) in 1976, when beef supplies were at record levels because of a liquidation of the nation's beef herd due to declining cattle prices and farm income. Consumption dropped significantly in the late 1970s, remained flat in the early 1980s, and then, from a 1980s high of 75 pounds per capita in 1985, declined steadily to 61.5 pounds in 1993. In 1994, increasing supplies of beef and declining beef prices spurred a 2-pound increase in per capita consumption of beef, the first increase in 9 years. Consumption inched up again in 1995.

- In contrast, per capita consumption of chicken, which remained flat in the early 1970s, steadily increased from 28.5 pounds (boneless equivalent) in 1976 to 50.4 pounds in



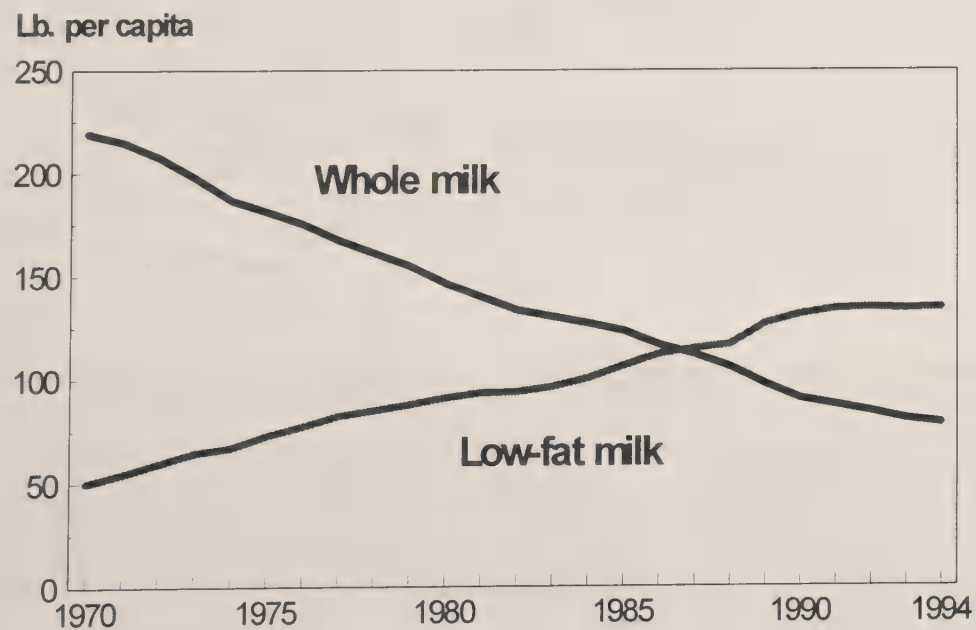
1995. Similarly, per capita consumption of turkey more than doubled from 7.0 pounds in 1976 to 14.4 pounds in 1995. Poultry has benefited from a lower real price than beef and from health-related concerns about beef. In addition, the poultry industry has provided scores of new brand-name,

value-added processed products for consumers' convenience, as well as a host of products for the away-from-home market.

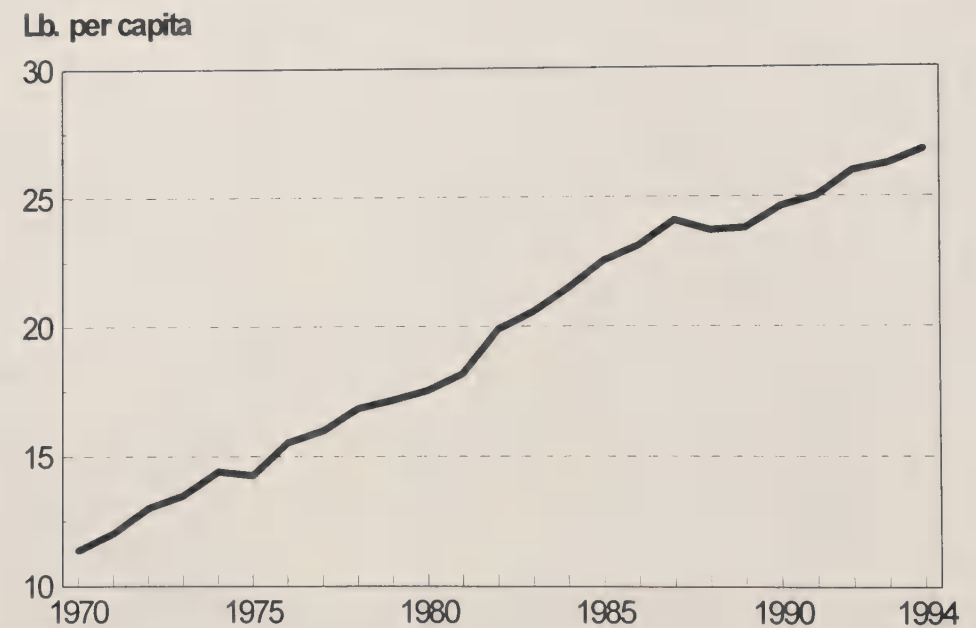
Shift to Low-Fat Milk

Per capita consumption of whole milk declined 64 percent from 1970 to 1994, while consumption of lower-fat milk increased 168 percent. This suggests that consumers will switch to more nutritious products when prices, convenience, taste, and availability do not present overriding barriers. However, when nutrition is not the only critical factor, as in the case of cheese -- a key ingredient in pizza, one of Americans' favorite fast foods -- consumption can move in another direction.

Americans Are Switching to Lower Fat Milks...



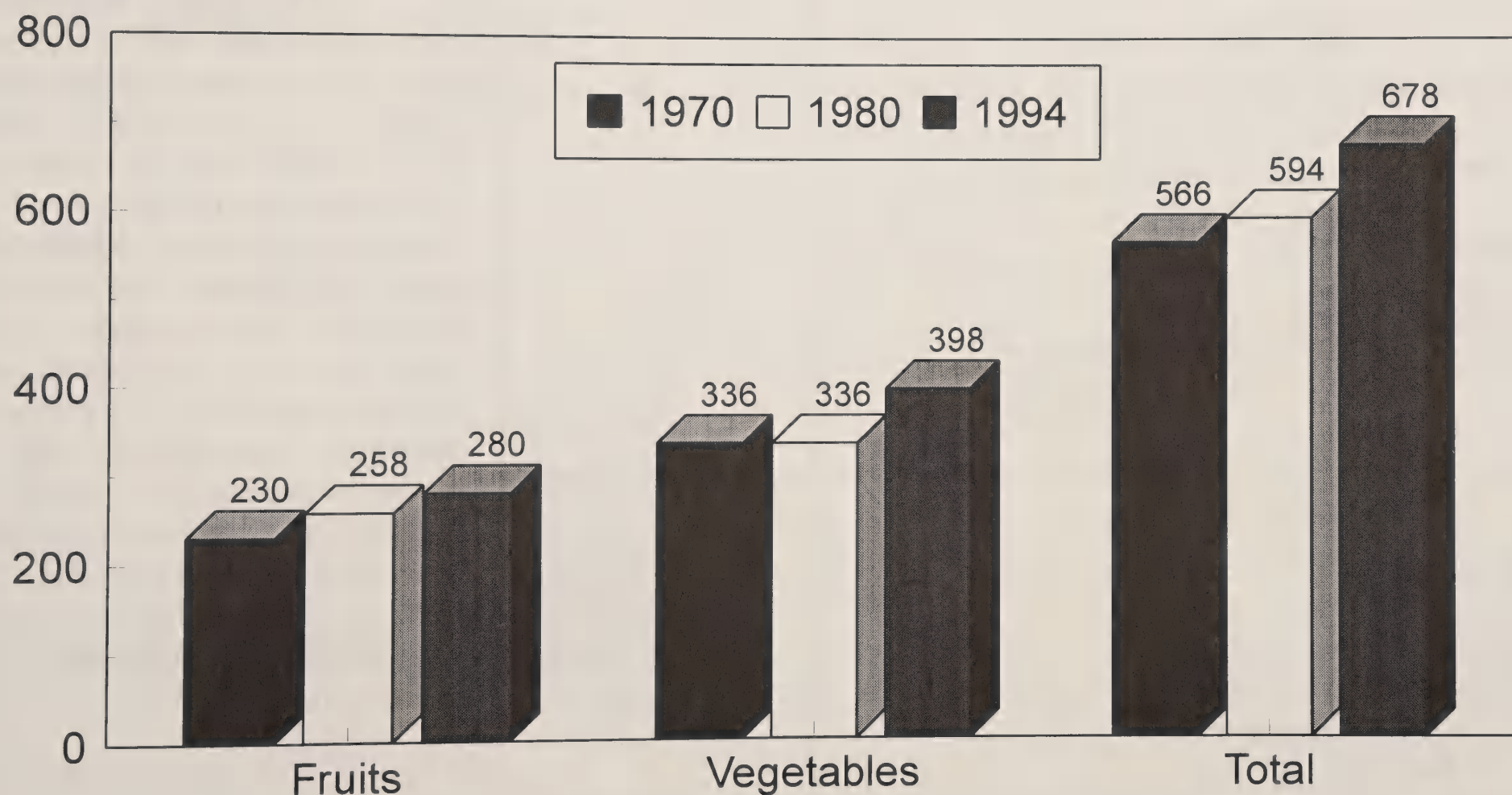
...But Cheese Consumption Continues To Rise



Per Capita Consumption of Fruits and Vegetables

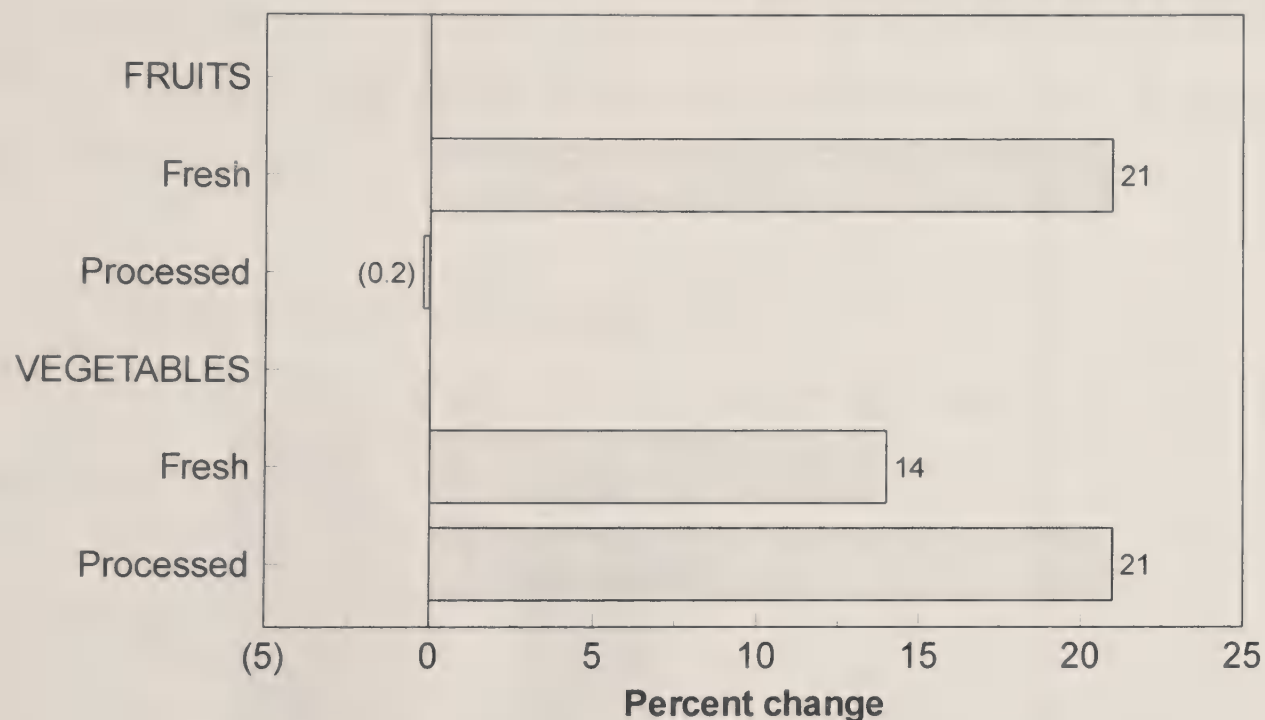
Consumption increased 20 percent from 1970 to 1994

Lb. per capita



Changes in Fruit and Vegetable Consumption, 1980-94

Processed fruits hold steady while others increase



Increase In Fruit and Vegetable Consumption

- Annual fruit consumption increased 50 pounds per capita over the same period, and vegetable consumption increased 62 pounds per capita. However, consumption of fruits and vegetables still remains below the levels recommended by the USDA Food Guide Pyramid.

- Better quality, increased variety and year-round availability have boosted consumption of fresh fruits, while price, convenience, and increasing preference for fast-food eateries and ethnic foods have hiked consumption of frozen vegetables (especially french fries) and canned tomato products. Price increases for both fresh fruits and vegetables were almost double that for processed varieties. However, despite the bigger price increases for fresh than processed, per capita consumption increased nearly 21 percent for fresh fruit, 14 percent for fresh vegetables, and declined 0.2 percent for processed fruit.

Suggested reading...

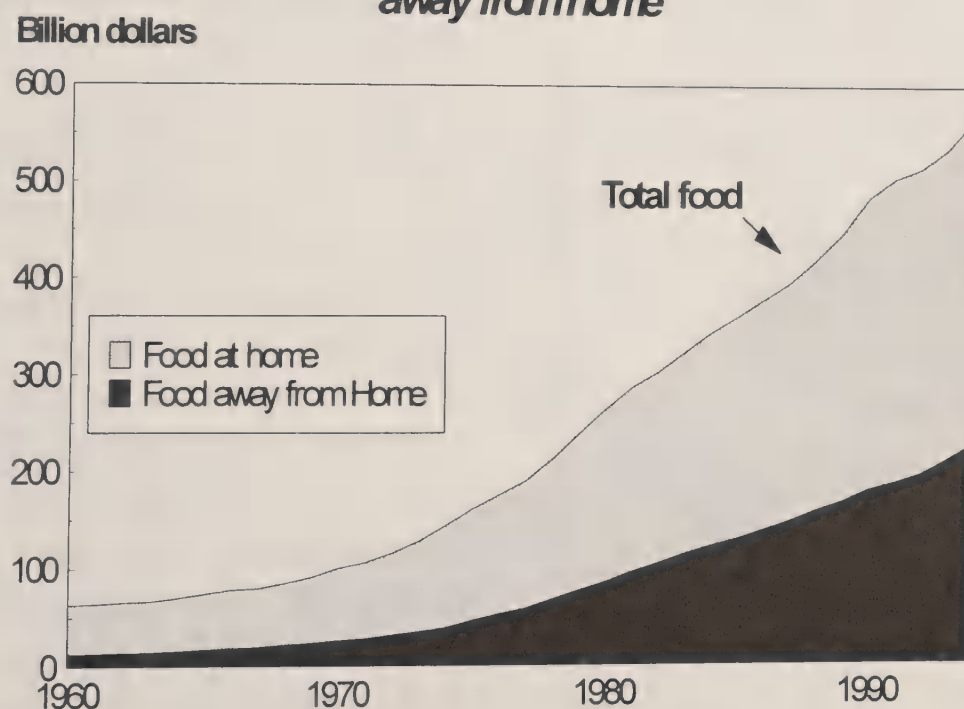
Frazao, Elizabeth. *The American Diet: Health and Economic Consequences*, Agricultural Information Bulletin 711, USDA, Economic Research Service, February 1995.

Income Growth Drives Consumption of HVPs

Consumer purchasing power has increased at about 2 percent per year. This has allowed consumers to increase their demand for quality, convenience, away-from-home dining, more expensive foods, nutritionally improved foods, and safer foods.

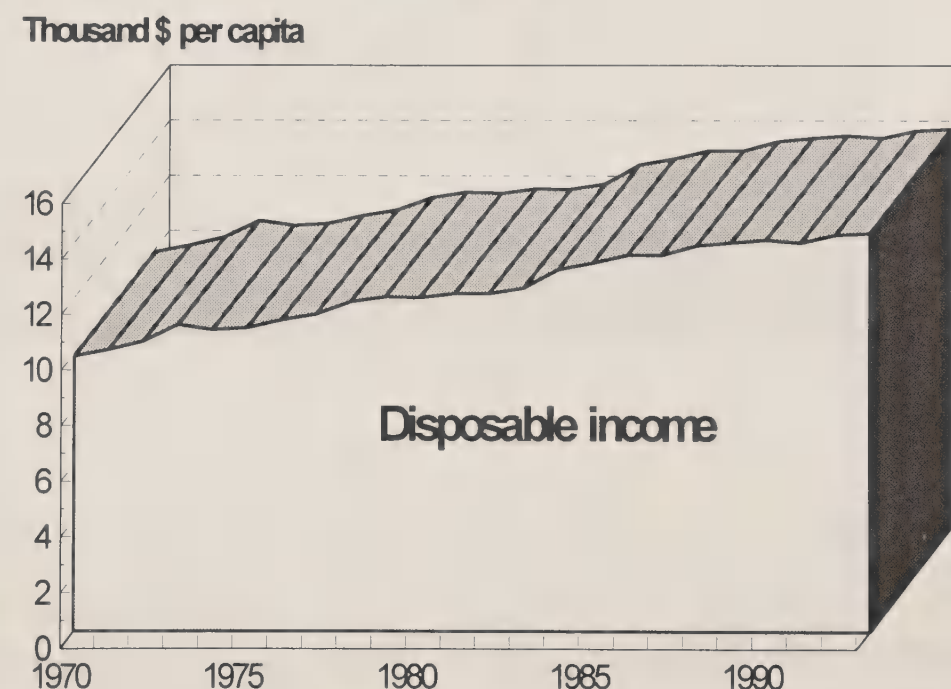
U.S. Food Expenditures by Families and Individuals, 1960-94

Food expenditures rise sharply, particularly for food away from home



Growth in Per Capita Disposable Income, 1970-95

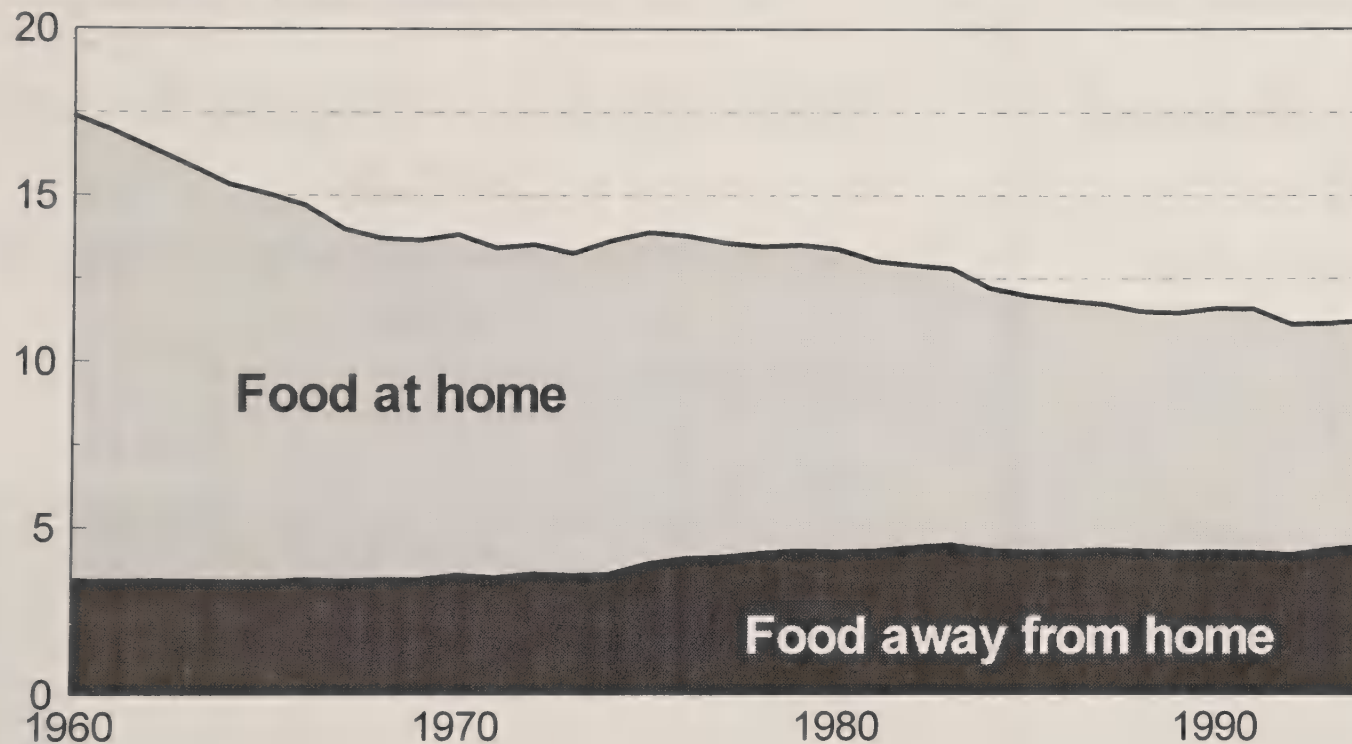
Consumer purchasing power continues to rise about 2 percent per year



Share of Income Spent on Food

Food-away-from-home share continues to grow

Percent of disposable income



compared with 13.8 percent in 1970, and 13.4 percent in 1980, and 11.3 percent in 1994.

- As income rises, the proportion spent for food declines, and there is more money available to spend on personal services and other discretionary items. Some of these additional services are purchased along with food and this helps to explain the increase in the percentage of income spent on food away from home.

- Compared with people in other Nations, Americans spend the smallest share of their household budget on food they eat at home. U.S. consumers' at-home food expenditures in 1992 as a portion of personal consumption spending totaled 8.7 percent compared with 10.5 percent for

Canada, 11.9 percent for the United Kingdom, 20.8 percent in Japan, and 38.4 percent in Russia. In less developed countries food expenditures can exceed one-half the budget.

Trends in Share of Food Spending

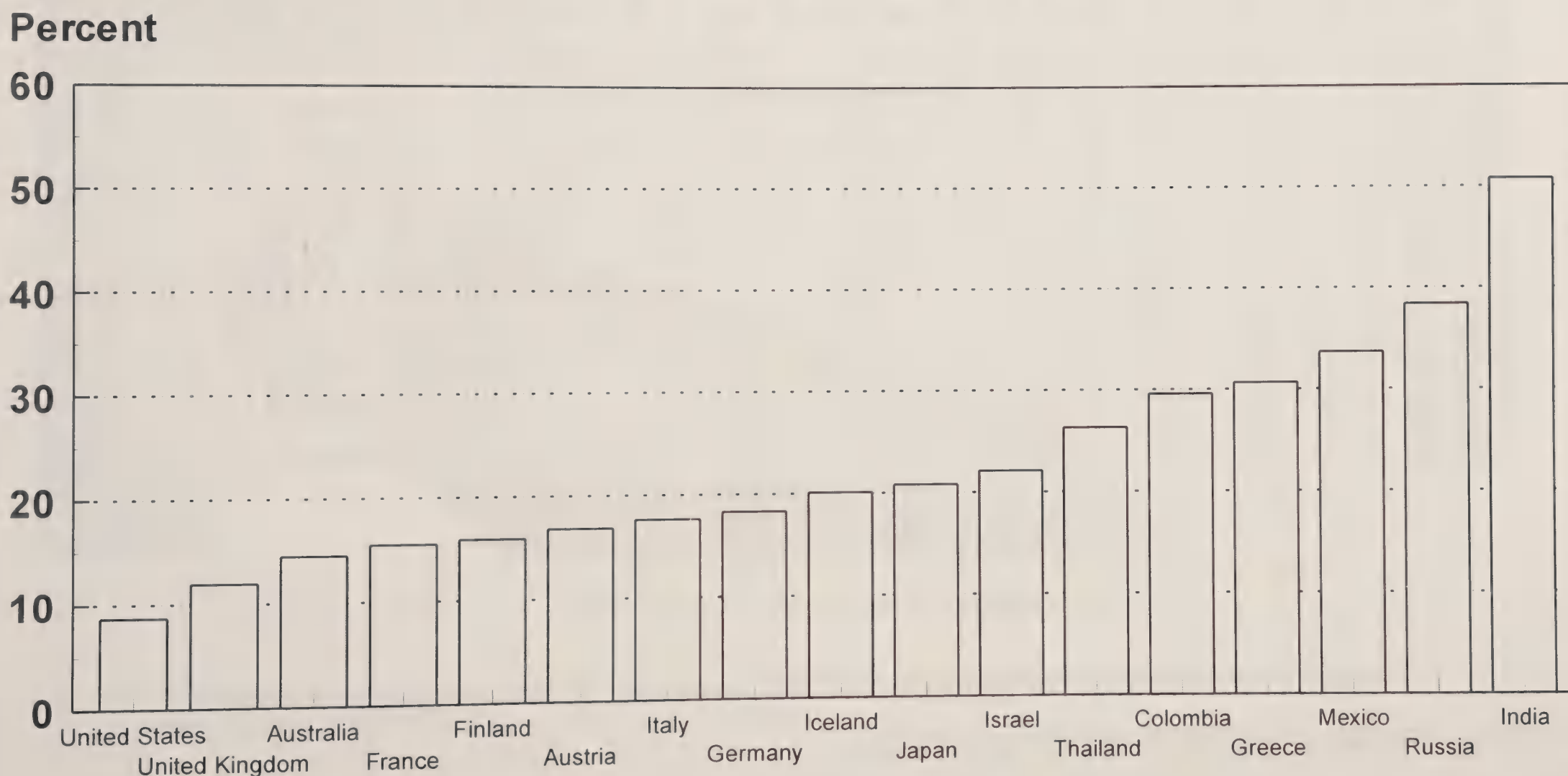
- Although food spending has increased considerably over the years, the increase has not matched the gain

in disposable income. As a result, the percentage of income spent for food has declined.

- Food expenditures by families and individuals were 17.4 percent of disposable personal income in 1960,

Percent of Total Personal Consumption Expenditures Spent on Food at Home

With abundant wealth and efficient agriculture, Americans spend smallest share of expenditures on food at home



Marketing Bill Rises As Proportion of Total Food Expenditures

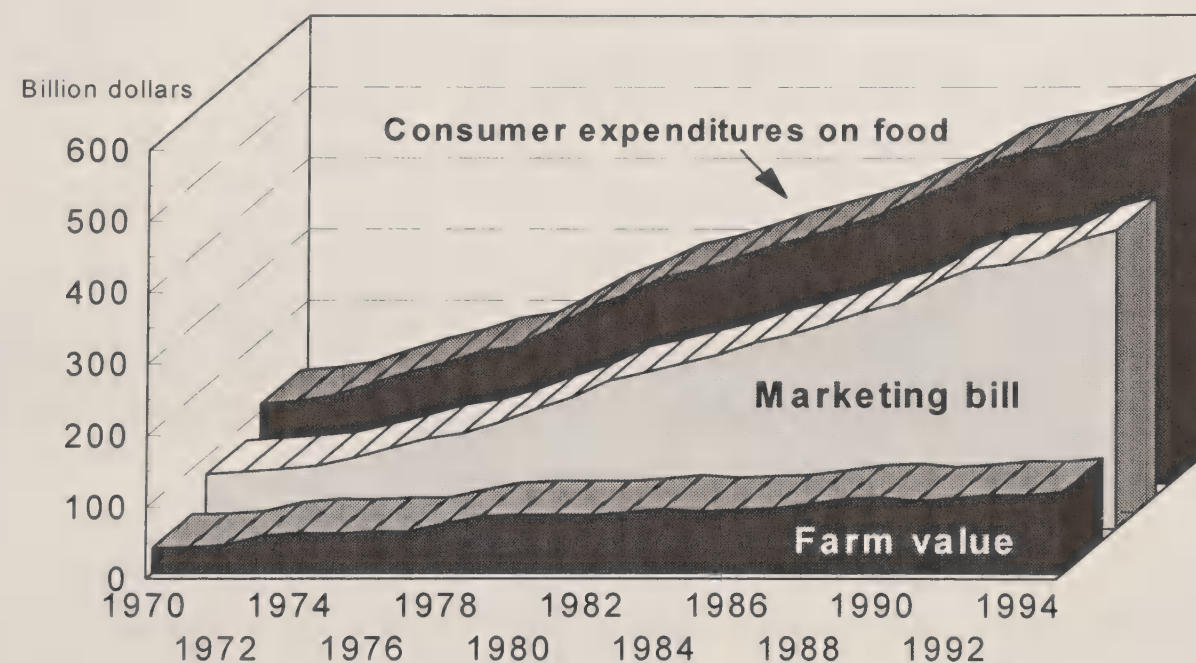
- Consumer expenditures for food increased fivefold between 1970

and 1994. However, the farm value share of each dollar spent on food has declined from 32 percent in 1970 to 21 percent in 1994. The marketing bill increased because of consumer demand for convenience, packaging, and dining out.

- Labor is the biggest factor in the marketing bill. In 1994, labor costs in the marketing bill accounted for 37 percent of the food dollar--76 percent more than the farm value.

Trends in Food Spending, Marketing Bill, and Farm Value, 1970-95

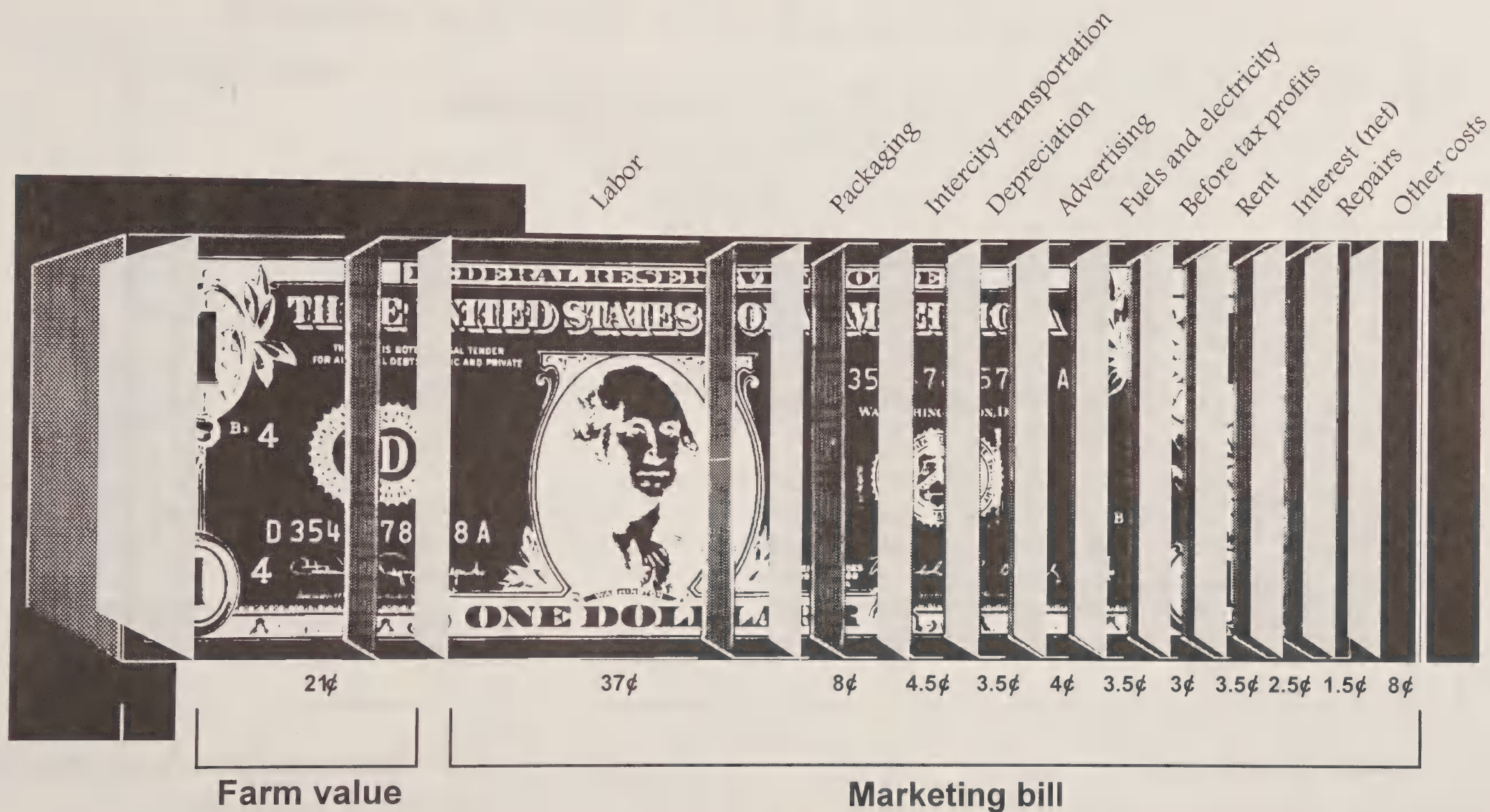
Over three-quarters of 1995 food expenditures went to pay marketing costs



For recent trends in food marketing costs...

Elitzak, Howard. "Food Marketing Costs Rose Less Than the Farm Value in 1995," *Food Review*, vol.19, issue 3 (Sept.-Dec. 1996), USDA, Economic Research Service.

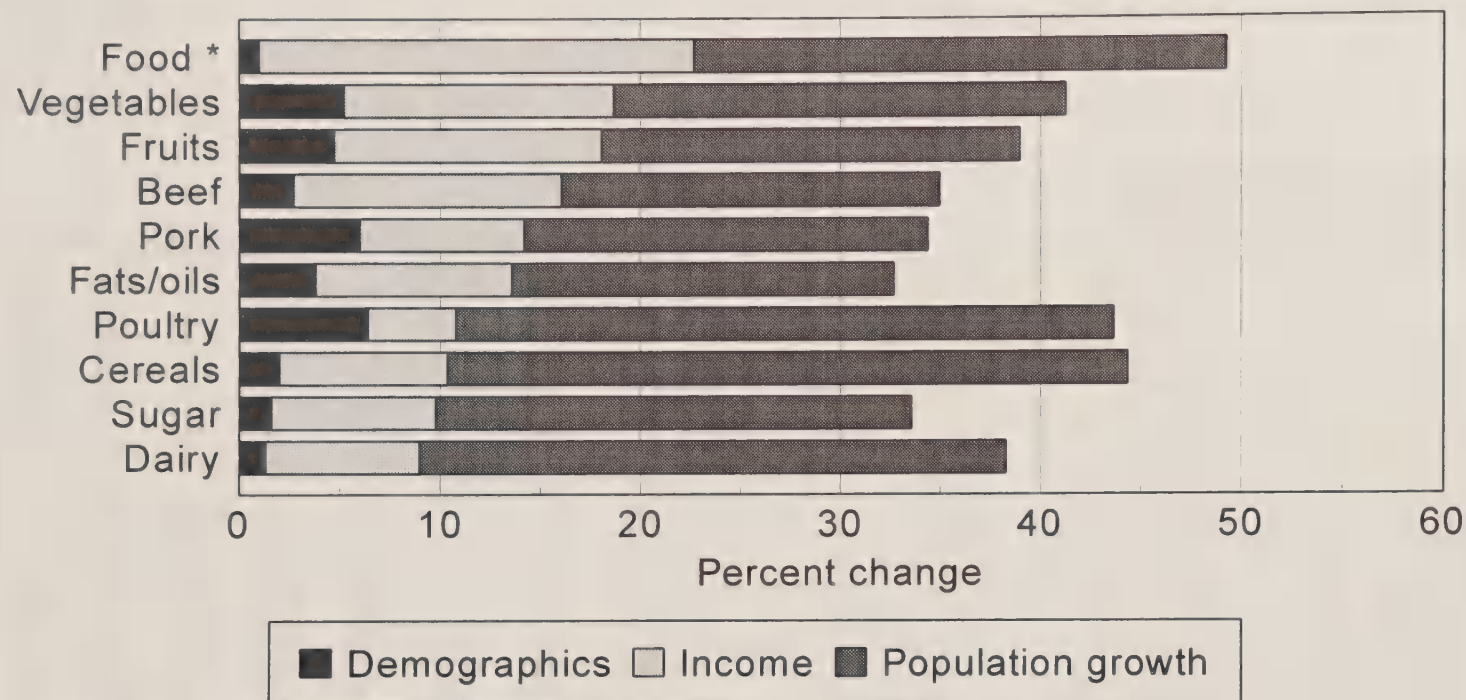
What a dollar spent on food paid for in 1994



Includes food eaten at home and away from home. Other costs include business taxes, property taxes and insurance, accounting and professional services, promotion, bad debts, and many miscellaneous items.

Major Factors Affecting Growth in U.S. Food Expenditures, 1980-2005

Income and population account for most of predicted growth



*Food includes food expenditures both at home and away.
Commodity categories include only expenditures for food at home.

Income and Population Growth Drive Future Food Spending

- While demographic characteristics such as age, sex, race, education, ethnicity, and region of residence explain much of the variation in

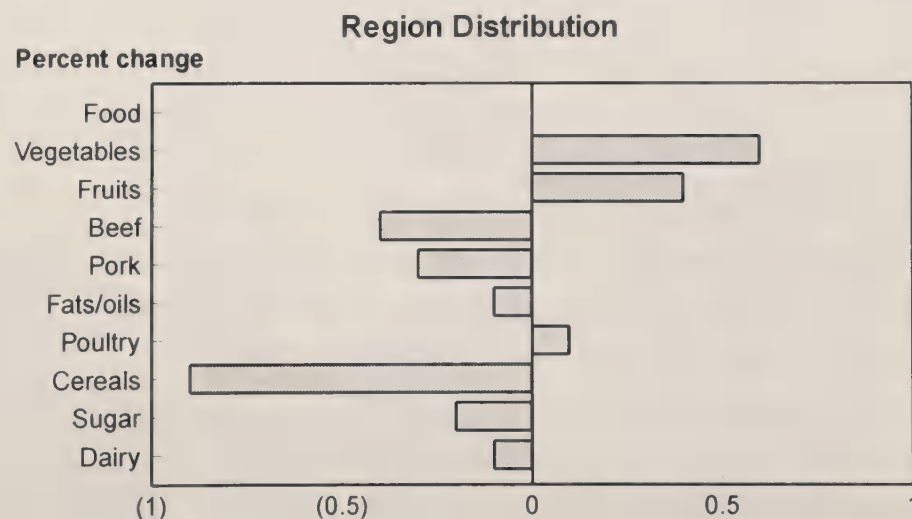
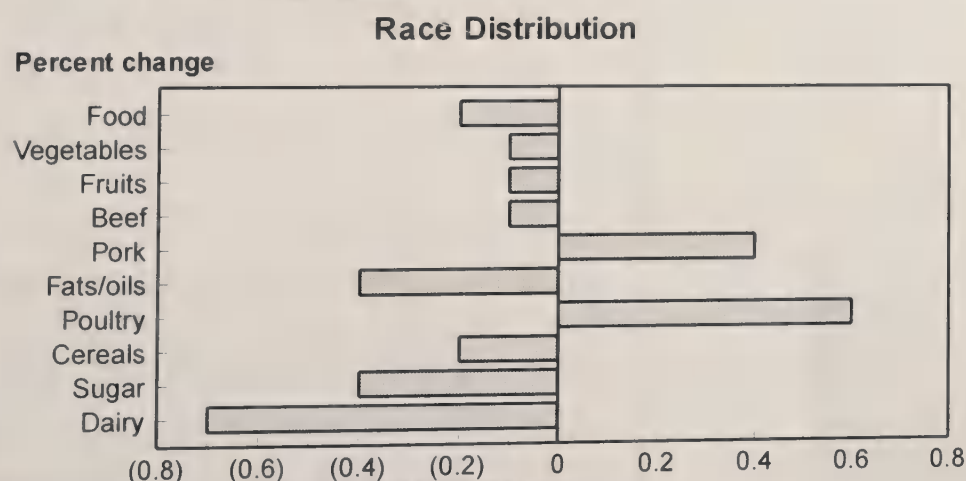
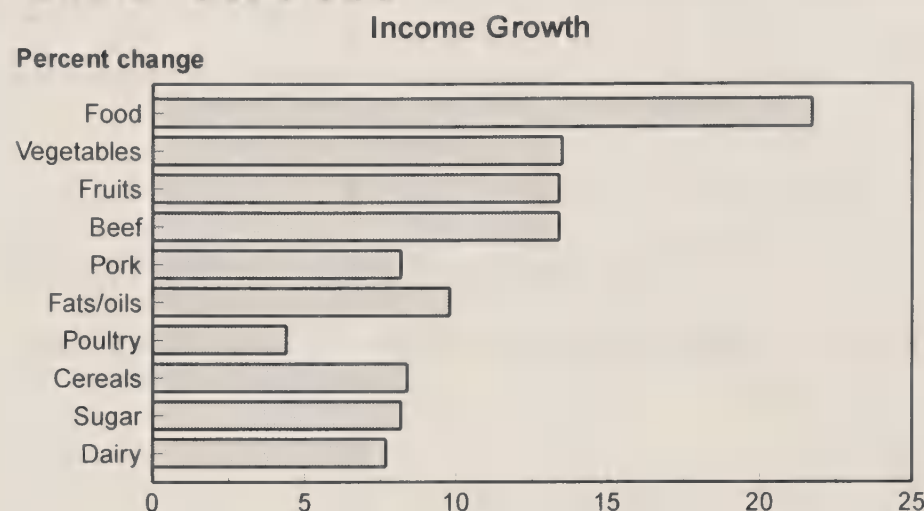
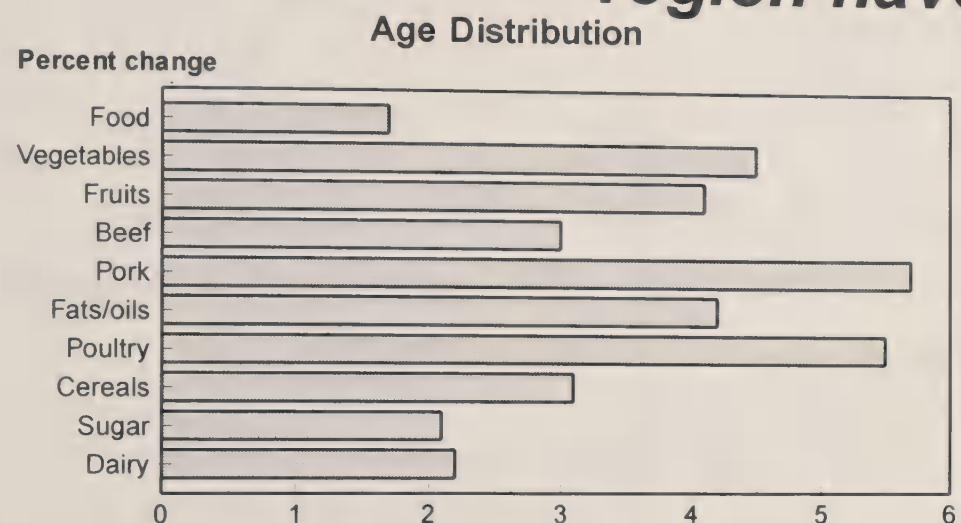
spending patterns observed among households, these factors will have minor influence on average consumption in the next decade. This is because these factors tend to change slowly over time and some trends tend to cancel out others.

For international comparisons of food spending...

Meade, Birgit and Stacey Rosen. "Income and Diet Differences Greatly Affect Food Spending Around the Globe," *Food Review*, vol.19, issue 3 (Sept.-Dec. 1996), USDA, Economic Research Service.

Projected Changes in Per Capita Food Expenditures, 1980-2005

Rising age and income boost expenditures while race and region have mixed effects



*Food includes food expenditures both at home and away.
Commodity categories include only expenditures for food at home.

The Projected Aging of the Population...

...and the growth in household income are expected to have a positive impact on per capita expenditures for all major food groups. Conversely, projected changes in the racial and regional mix of the population are expected to have a small, but mixed,

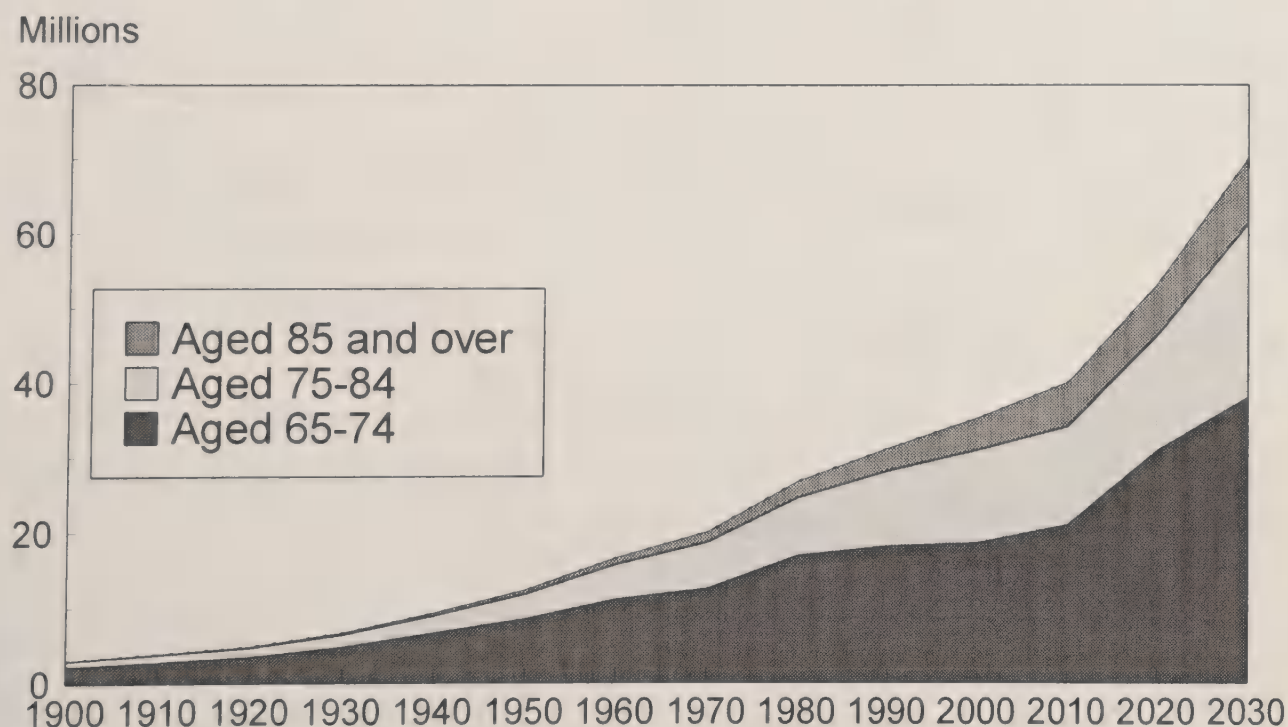
effect on per capita expenditures.

- This century the number of persons in the United States under age 65 has tripled. At the same time, the number aged 65 or over has jumped by a factor of 11. Consequently, the elderly, who comprised only 1 in every 25 Americans (3.1 million) in 1900, made up 1 in 8

(33.2 million) in 1994. Declining fertility and mortality rates also have led to a sharp rise in the median age of the Nation's population--from 20 years old in 1860 to 34 in 1994. Life expectancy increased from 47 years in 1900 to 68 years in 1950, and steadily rose to 76 years in 1991.

The Elderly Population

The elderly are growing both in numbers and age



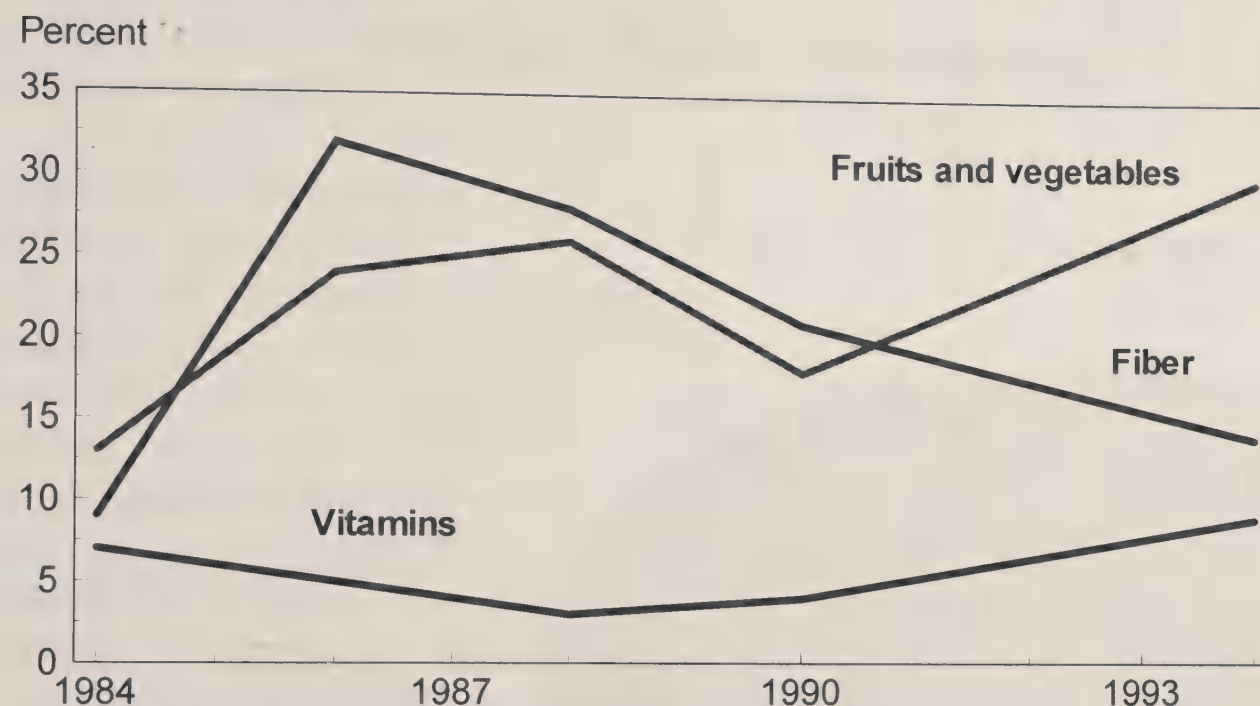
ERS research on food safety economics...

Buzby, Jean C., Tanya Roberts, C.-T. Jordan Lin, and James M. MacDonald. *Bacterial Foodborne Disease: Medical Costs and Productivity Losses*, Agricultural Economic Report 741, USDA, Economic Research Service, August 1996.

Kuchler, Fred, Katherine Ralston, Laurian Unnevehr, and Ram Chandran. *Pesticide Residues: Reducing Dietary Risks*, Agricultural Economic Report 728, USDA, Economic Research Service, January 1996.

Trends in Awareness of Diet Factors Related to Cancer, 1982-94

Awareness of specific dietary factors related to cancer is low



The Scientific Linkage Between Diet and Health is Growing Stronger Every Day

- According to the *Surgeon General's Report on Nutrition and Health* (1988), "For the two out of three adult Americans who do not

smoke and do not drink excessively, one personal choice seems to influence long-term health prospects more than any other: what we eat."

- Some 300,000 deaths per year—14 percent of the total—have been attributed to poor diets and/or inadequate physical activity (McGinnis, J. Michael, and William H.

Foege. "Actual Causes of Death in the United States," *Journal of the American Medical Association*, Nov. 10, 1993).

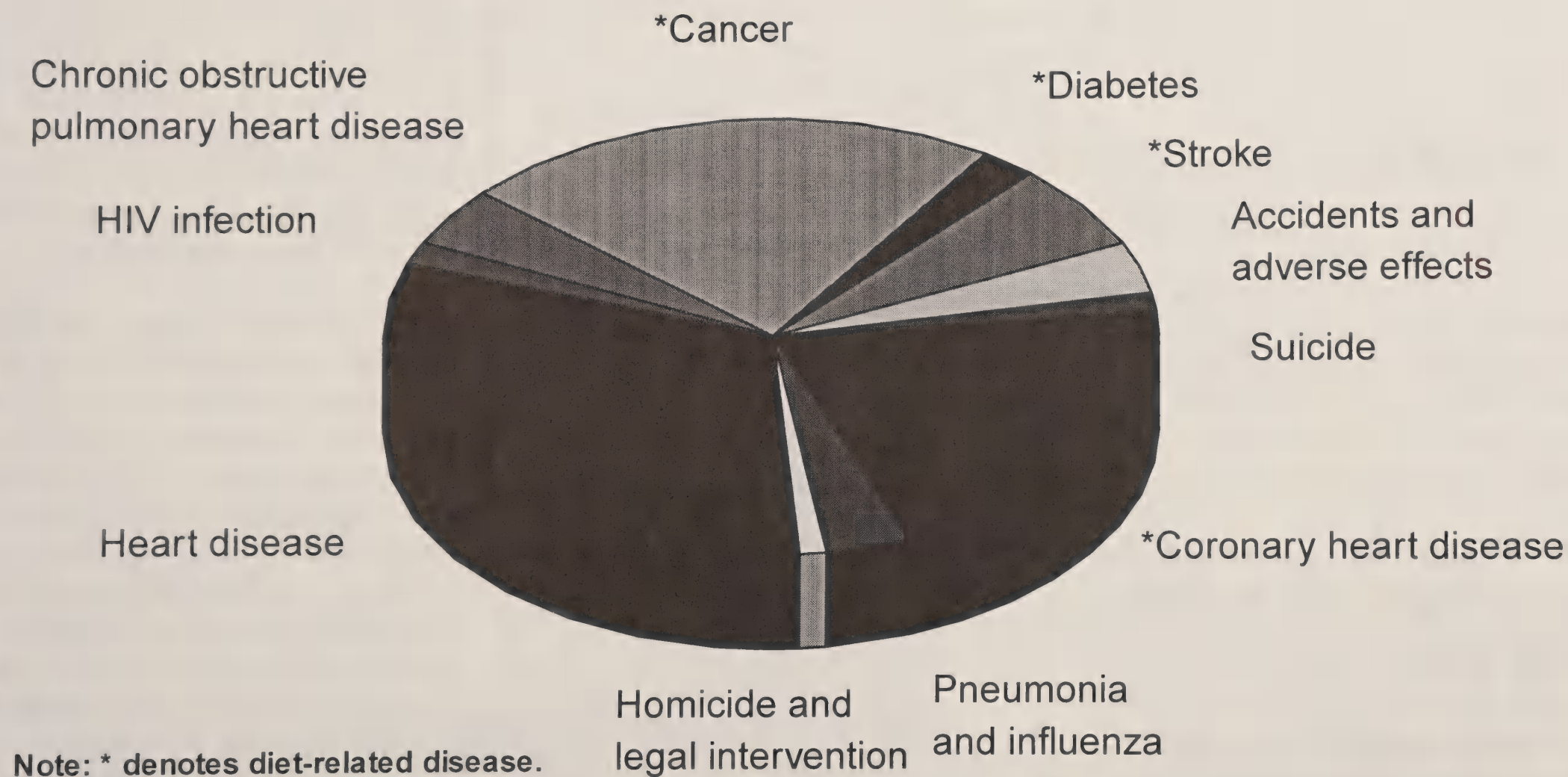
- Recent USDA surveys of the diet and health knowledge and attitudes of homemakers with children reveal that the vast majority of them are aware of health and nutrition relationships for specific nutrients. Awareness of the link between nutrients and health is particularly high for over-consumed nutrients such as food energy, fat, saturated fat, cholesterol, and sodium. Awareness tends to be lower for under consumed nutrients like iron, fiber, and calcium.

- However, parents' awareness of these diet-health relationships is apparently insufficient for changing the dietary practices of their children. The dietary intake of most nutrients is about the same for the children of aware and unaware parents. A key issue for nutrition educators is to identify barriers to good dietary practices and develop successful techniques and methods for improving the dietary practices of children.

- USDA's recently developed Healthy Eating Index (HEI) reveals that the diets of three out of every four

Top 11 Causes of Death, 1993

Four of the top 11 causes are diet-related



individuals need improvement. Only 11 percent of diets are found to be good and 15 percent are found to be poor. The findings are based on a representative sample of 7,463 individuals in the 1989 and 1990 USDA Continuing Survey of Food Intake by Individuals conducted by the Agricultural Research Service.

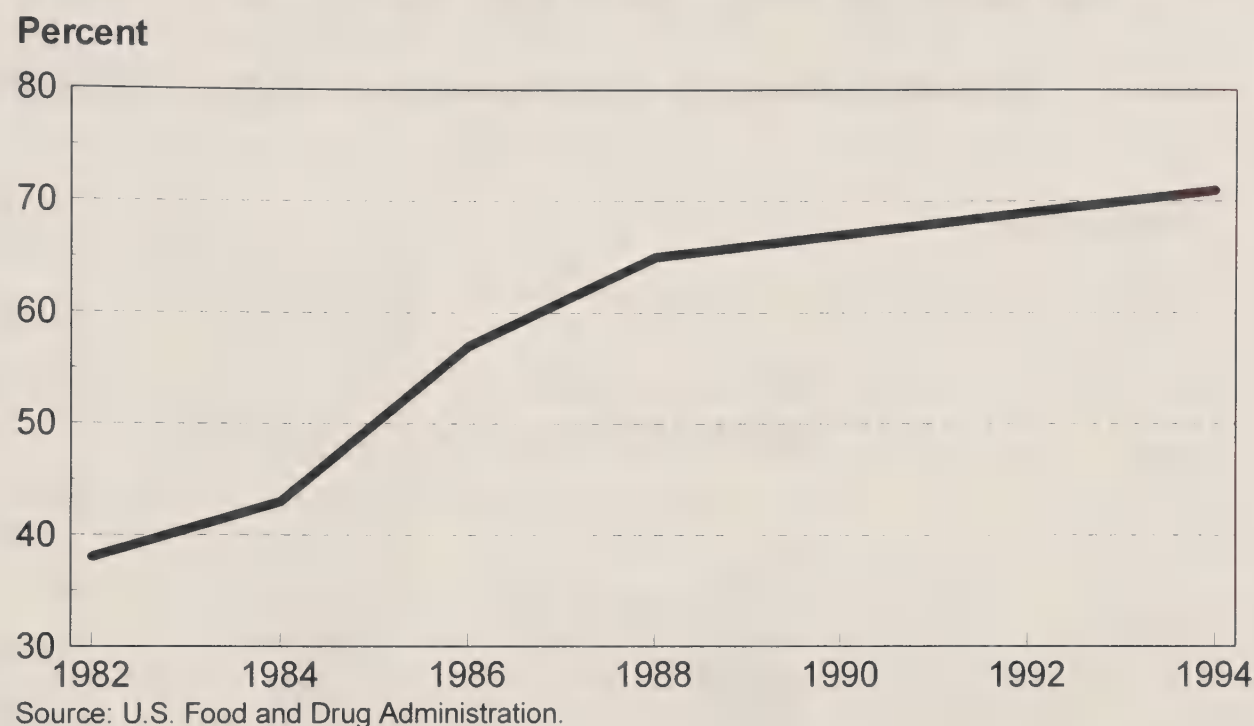
- Less than one-third of the population consumed recommended servings of milk and meat groups and fewer than one-in-five consumed recommended servings of grains, vegetables, and fruits. Less than 20 percent achieved the recommendations for fat and saturated fat, only 35 percent the recommendation for sodium, and less than one-third achieved the recommendation for variety in dietary patterns. The HEI improves with education and income of the household. The index was higher for children, older people, and women. People with higher HEI score correlated with better nutrient intake.

Awareness of Dietary Factors Related to Cancer Remains Low

- Only one in three Americans is aware of the relationship between fruit and vegetable consumption and cancer—even though the National

Trends in Awareness of the Dietary Fat-Heart Disease Link

There was significant growth in the 1980s but now it is leveling off



Cancer Institute's Five-A-Day program has been emphasizing the importance of eating at least five servings a day of fruits and vegetables to reduce the risk of cancer.

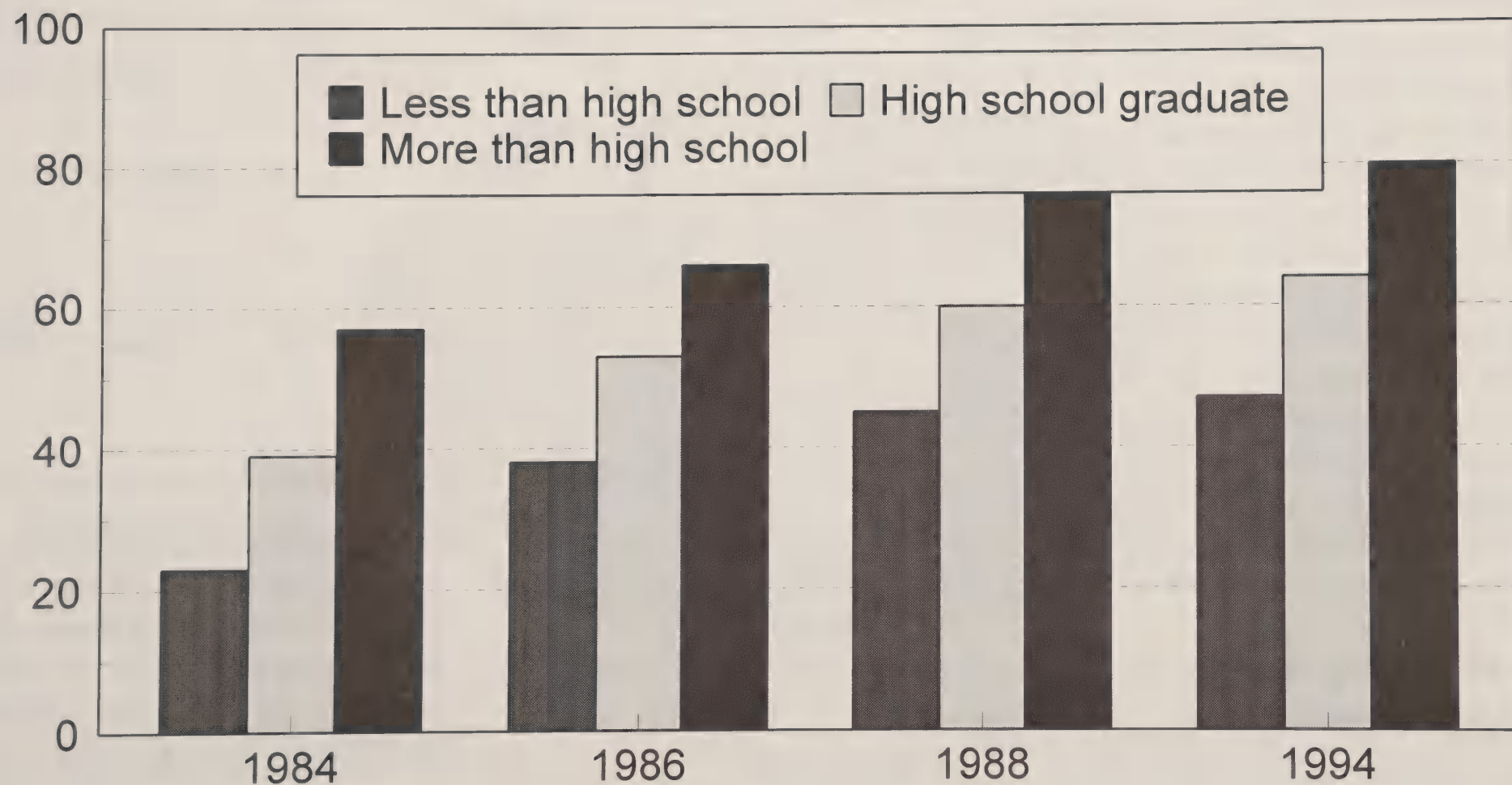
- Awareness of the relationship between diet and disease is rising for vitamins and fruit and vegetable consumption. Awareness of the link

between fiber and cancer rose after 1984 when Kellogg's began highlighting the linkage in its advertising for All-Bran cereal. After all the "hoopla" in the cereal and bakery industry, the awareness declined.

Awareness of the Dietary Fat-Heart Disease Link By Level of Education

Awareness increases significantly with education

Percent



Awareness of the Relationship Between Fat Consumption and Heart Disease Has Increased Significantly

- Since 1982, awareness of the relationship of dietary fat to heart disease has increased from 38 percent to 71 percent. However, the growth in awareness has leveled-off in the 1990s. Those with the most education tend to be more aware. There has been little change in awareness patterns since 1988, and the gap in awareness levels among those with differing levels of education has not decreased. As might be expected, those with the least amount of formal education are most in need of nutrition education.

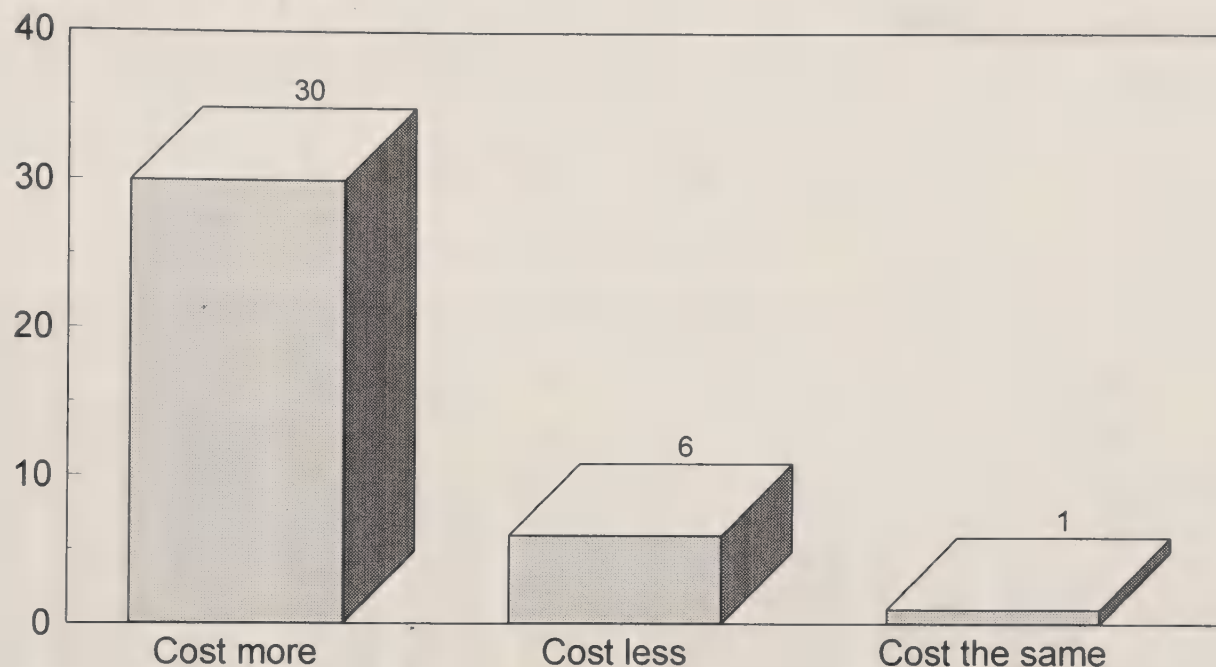
Suggested reading...

Variyam, Jayachandran N., James Blaylock, and David Smallwood. *Diet-Health Information and Nutrition: The Intake of Dietary Fats and Cholesterol*, Technical Bulletin 1855, USDA, Economic Research Service, February 1997.

Cost Comparisons: Nutritionally Improved and Regular Products, 1993

Nutritionally improved products usually cost more

Number of categories



Sales of Nutritionally Improved Foods Increasing But These Foods Cost More

- Nutritionally improved foods accounted for 78 percent of increased volume sales between 1989-93. The market share of nutritionally improved versions increased 3 percentage

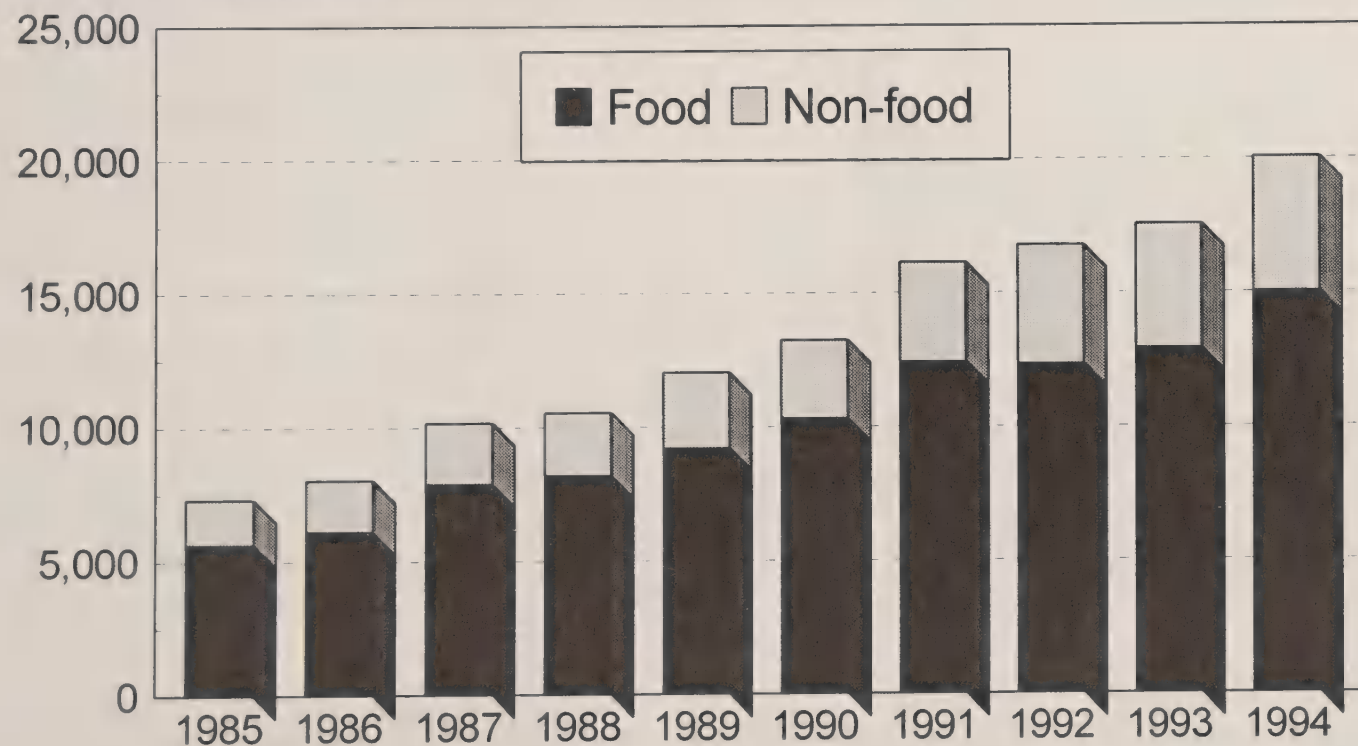
points between 1989-93.

- Nutritionally improved versions are defined as such if they offered at least one nutritional improvement over the traditional counterpart. Some of the nutritional improvements included nutrition-related claims such as "low fat," "light," "packed in water," while others were classified on ingredients

New Grocery Product Introductions

Over 15,000 new food products were introduced in 1994

Number of products



Competition Among Food Processors for the Consumer's Dollar is Fierce

- Food processors continue to develop and promote new products to please the consumer. In 1994, more than 15,000 new food products were introduced, about three times as many as a decade earlier. According to industry estimates, food processors spend about \$2 on retail promotion (trade shows, promotions, discounts and allowances, and other incentives) for every \$1 in direct advertising.

- Most new product introductions are further differentiation of already existing

such as ice milk, sherbet, and frozen yogurt versus ice cream, poultry-based hot dogs versus beef and pork-based products, and diet versus nondiet carbonated beverages.

- Nutritionally enhanced foods

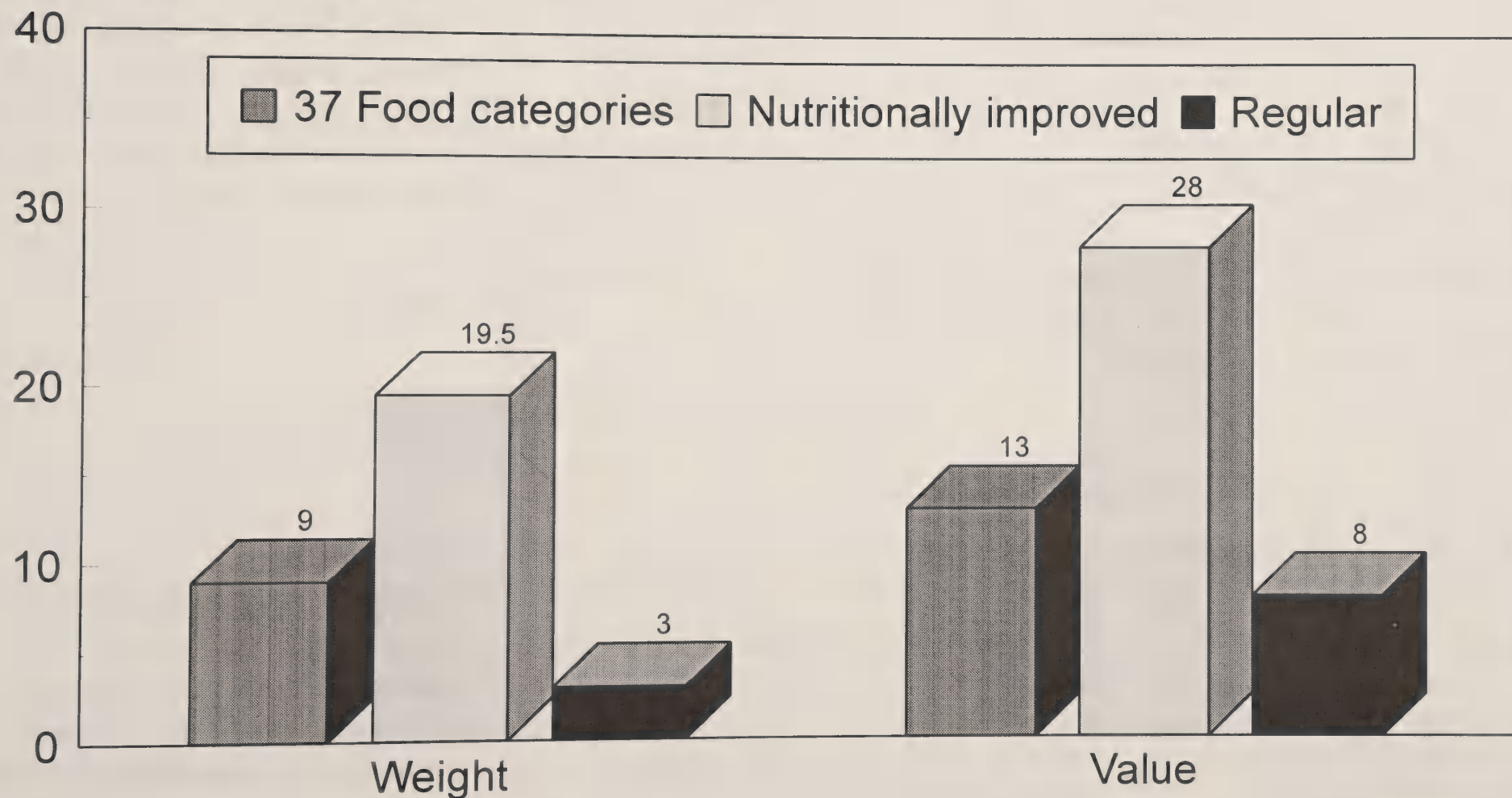
tend to cost more. Price differences ranged from \$0.03 to \$1.86 per pound (2 to 94 percent higher than regular versions) in 1993. For over half of these categories the price difference was larger in 1993 than in 1989.

products. Highly processed foods such as candy, baked products, beverages, and condiments account for most of these new product introductions.

Growth in Nutritionally Improved and Regular Products, 1989-93

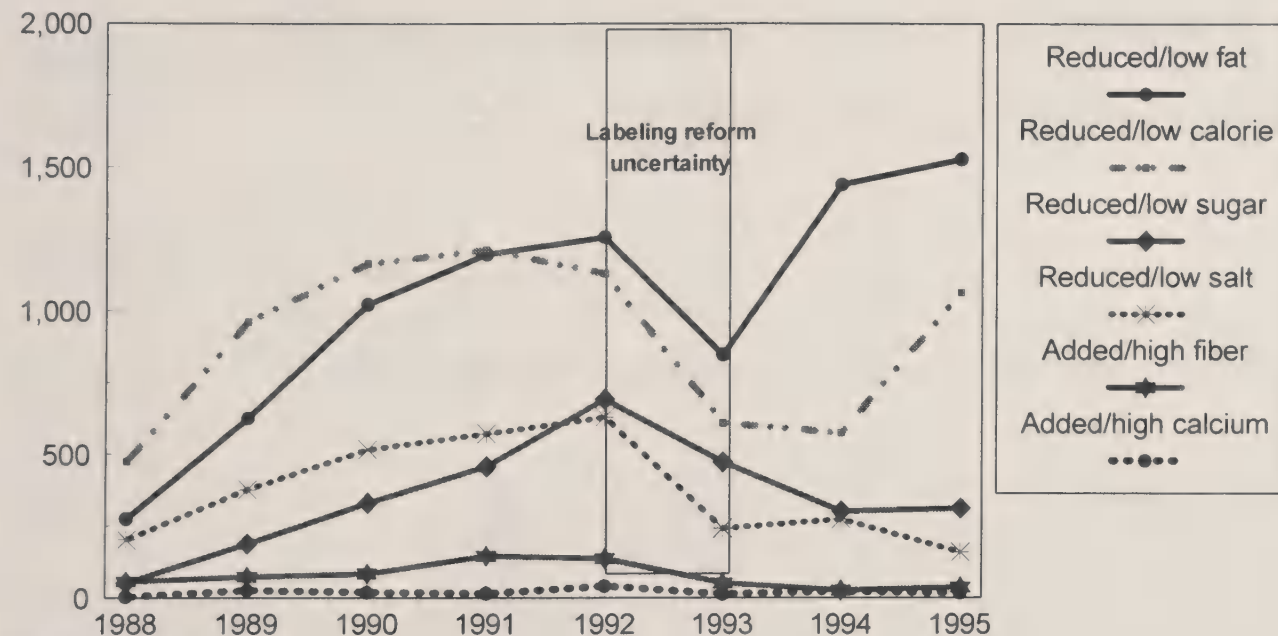
More nutritionally improved versions have grown in both weight and value

Number of categories



Number of New Products Bearing Nutrient Content Claims

Nutrient content claims are on the rise



Source: New Product News.

Note: New nutrient claims are not additive, as new products may carry more than one claim.

were nothing more than advertising hype. But with the publication of new food labeling regulations in January 1993, the Federal government addressed the problem of misleading nutrition claims and helped reestablish the credibility of the food label. The regulations spell out which nutrient content claims are allowed and under what circumstances they can be made. There are 11 core terms: "free," "low," "lean," "extra-lean," "high," "good source," "reduced," "less," "light," "fewer," and "more." The advantage for both industry and consumers is that now everyone plays by the same rules.

Appealing to Rising Consumer Awareness of the Linkage Between Diet and Health

- The food industry has developed thousands of new food products each year with nutrient content claims. The number of new products making nutrient claims is on the rise. Claims tend to focus on *reduced* or

low fat, cholesterol, calories, or sugar. Fewer new products claim that particular nutrients are high or have been added. Fiber and calcium are the most frequently cited nutrients on new products to have high or added levels.

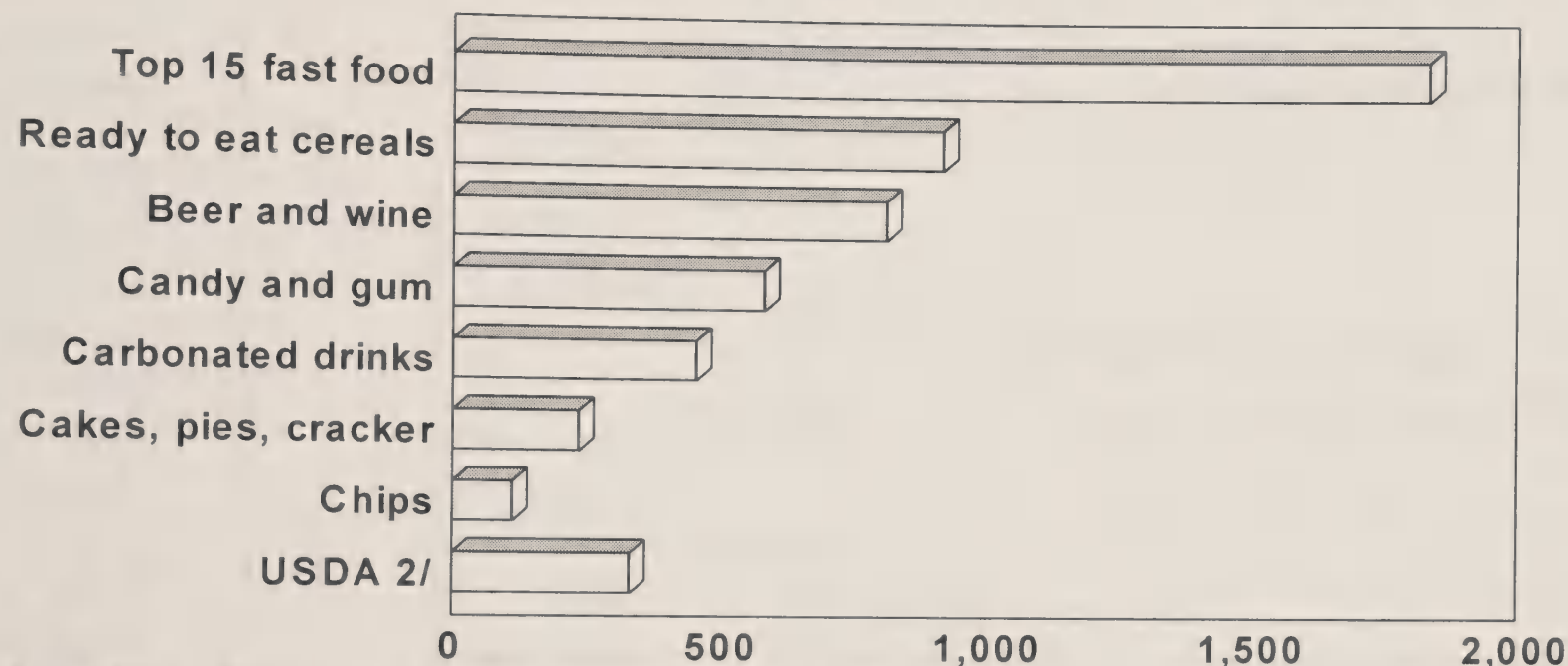
- Before recent food labeling reform, many nutrient content claims

Suggested reading...

Frazao, Elizabeth and Jane E. Allshouse. *Size and Growth of the Nutritionally Improved Foods Market*, Agriculture Information Bulletin 723, USDA, Economic Research Service, April 1996.

USDA Nutrition Education and Food Industry Advertising ^{1/}

Nutrition messages must compete with industry advertising



Source: Leading National Advertising and Economic Research Service.
 1/ 1995 data. Industry advertising expenditures for dissemination (media) only
 Does not include preparation costs
 2/ Includes WIC funds targeted for nutrition education.

Nutrition Education Messages Must Compete...

- ...with many different advertising messages from the food industry as well as the nutrition "fad of the month" in magazines, newspapers and book stores. In 1995, USDA

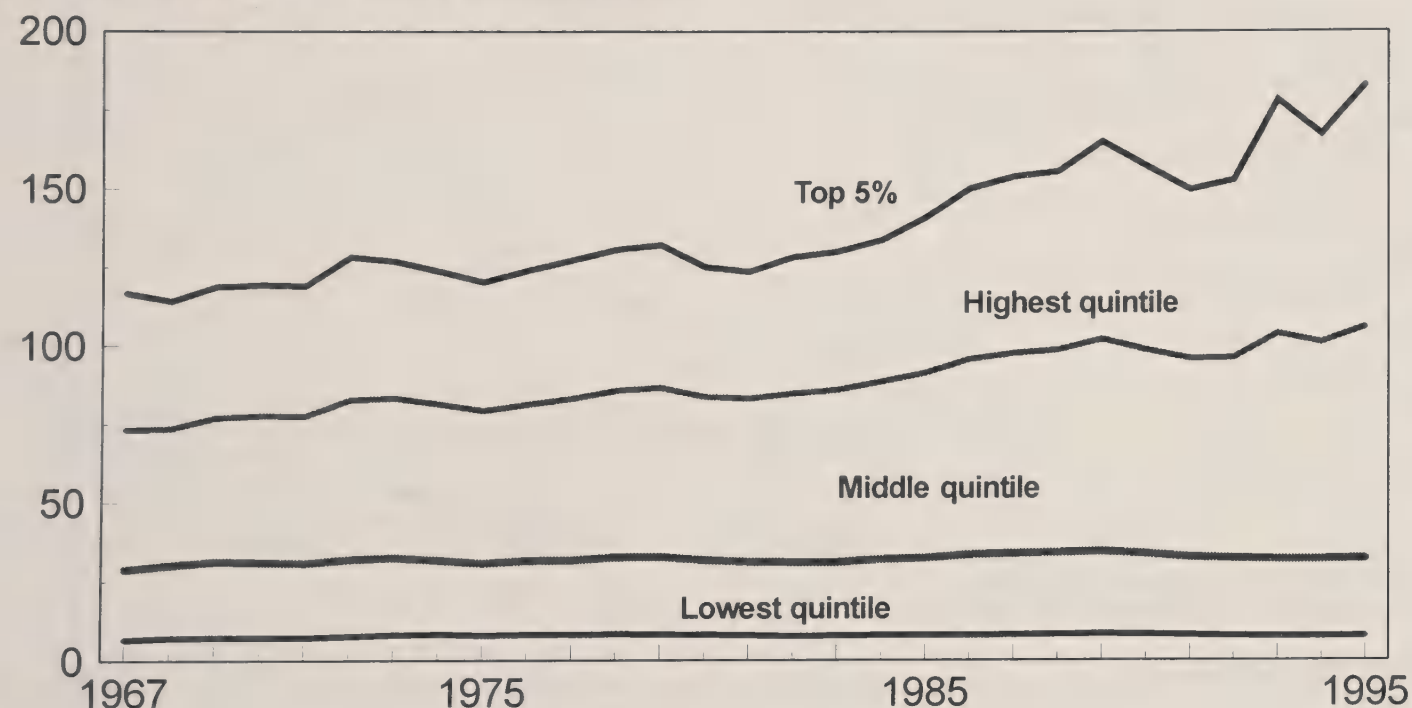
spent about \$327 million on nutrition education. This includes \$151 million for WIC formula funds, \$61 million for The Expanded Food and Nutrition Education Program (EFNEP), and \$24 million for WIC breast-feeding promotion. In contrast, the food industry spent over \$10 billion in direct con-

sumer advertising. All combined, USDA spent less on nutrition education support and delivery than the food industry spent on advertising media for carbonated soft drinks and less than one-half the amount that the food industry spent for promoting ready-to-eat cereals.

Trends in Average Family Income by Selected Income Groups

The poor remain poor while the rich get richer

\$/year (1000s of 1994 U.S. dollars)



Source: U.S. Census Bureau.

have shown marked growth. The largest growth in average income has been in the top 5 percent of the population. As a consequence, there is growing inequality in income among families.

- The growth in income inequality is associated with growth in the inequality of wages. Wage growth is greatest for the more highly skilled, trained, and educated workers. In contrast those at the bottom of the wage pool have experienced losses in real wages. At the same time, changes in long-run living arrangements have tended to exacerbate the wage effects on income. For example, divorces and

Growing Income Inequality Expands Need for Food Assistance

- While average purchasing power of families continues to in-

crease, not all families have benefited from this growth. According to a recent study by the Census Bureau, the average income of families in the lowest quintile (poorest fifth) of the population has shown no growth while those in the highest quintile

separations, births out of wedlock, and the increasing age at first marriage have led to a shift away from married couple households and toward single parent and nonfamily households which typically have lower incomes.

Food Stamps are the Largest USDA Program

- In 1995, USDA provided \$37.8 billion or over 60 percent of its total budget for domestic food assistance. The Food Stamp Program accounts for about 2 out of every 3 USDA food assistance dollars.

- Food assistance began in the 1930s as commodity donation and farm support programs. Rapid growth in food assistance outlays began in the late 1960s with the initiation of the Food Stamp Program and an increased focus of food programs on feeding needy people. There was also growth in food assistance targeted for school age children and other groups at nutritional risk such as pregnant women and their young children. Food Stamps account for the majority of the growth in food assistance program budget. Today, commodity donation programs account for only a small share of budget outlays and are highly dependent on variation in farm programs and conditions.

- Food assistance programs can be broadly categorized into four groups:

- Food Stamps (includes Nutrition Assistance for Puerto Rico and the Northern Marianas);

- Child Nutrition (includes the National School Lunch Program, School Breakfast, the Special Milk Program, Child and Adult Care Food Program, and the Summer Food Service Program);

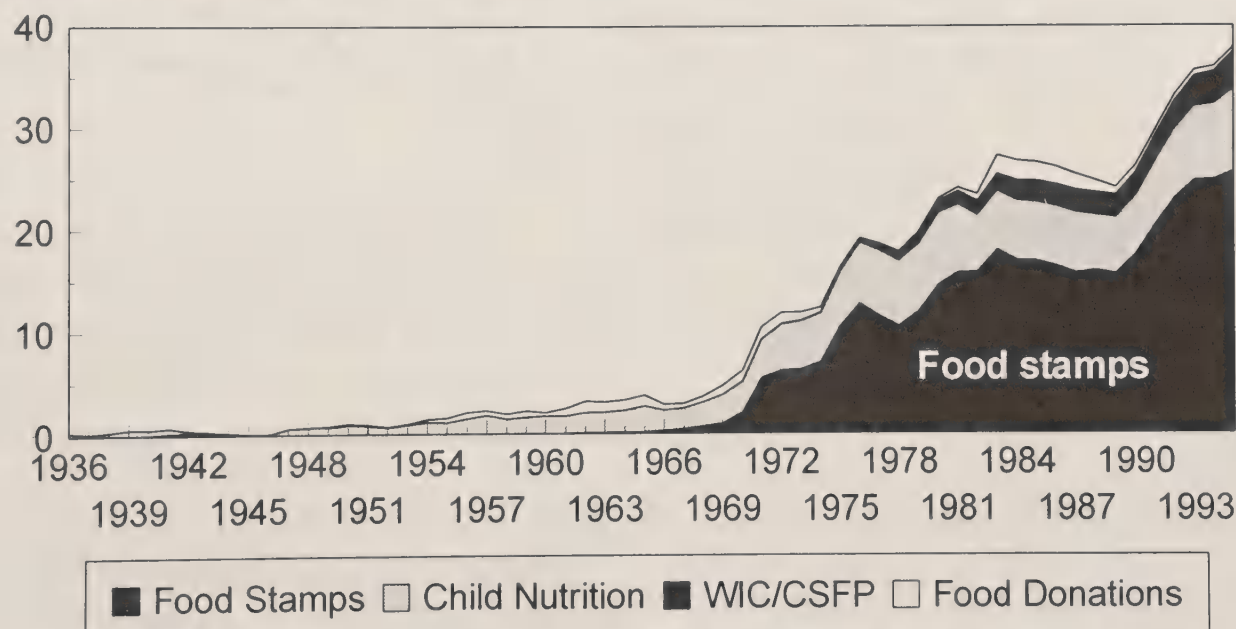
- WIC/CSFP (includes the Special Supplemental Program for Women, Infants, and Children and the Commodity Supplemental Food Program);

- Food Donations (includes the Nutrition Program for the Elderly, Food Distribution to Charitable Institutions, Soup Kitchens, and Food Banks, Disaster Feeding, and the Emergency

Food Assistance Program Trends

Food Stamp Program grows substantially

Billion U.S. dollars

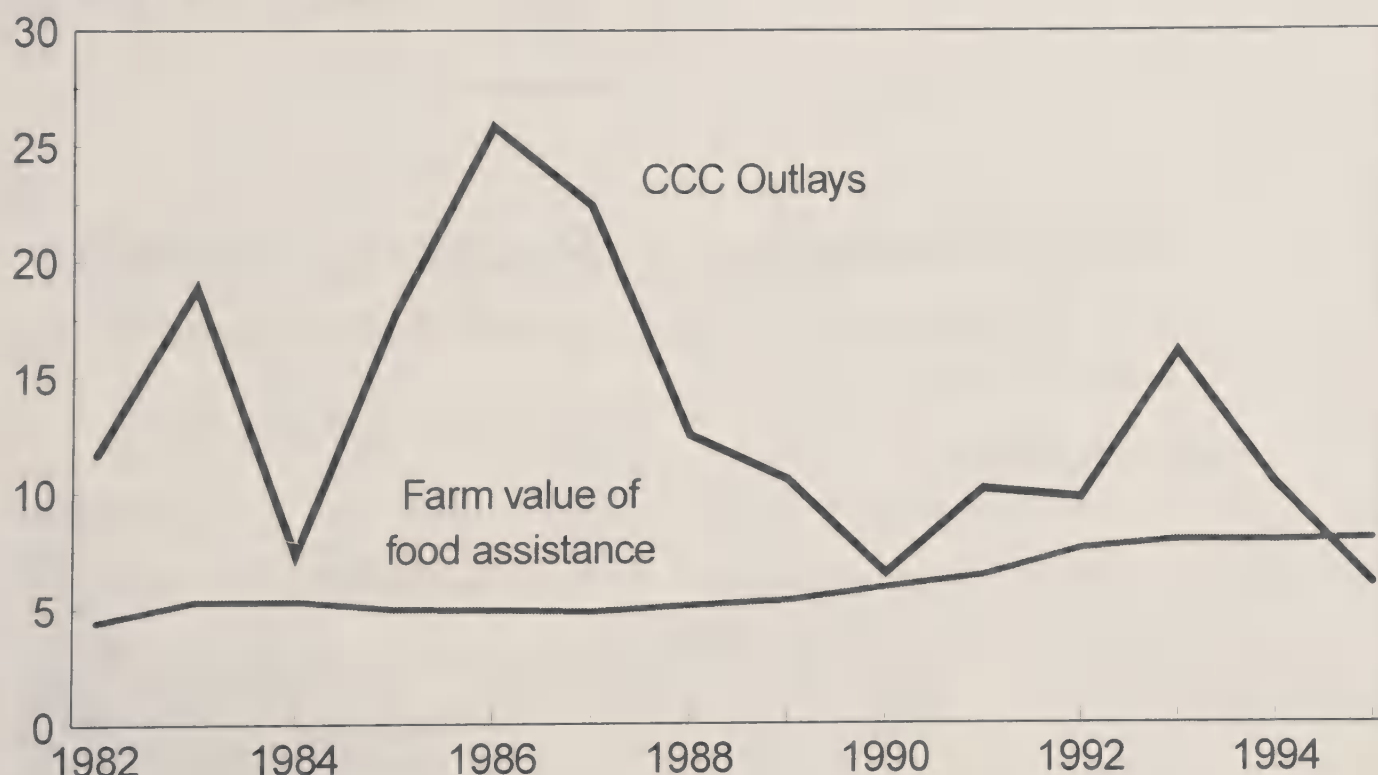


Note: 1994 dollars.

CCC Outlays and the Farm Value of Food Assistance

Farm value of food assistance overtakes CCC outlays in 1995

Billion U.S. dollars



ERS' Food Review magazine follows developments in U.S. food assistance programs...

Price, Charlene and Betsey Kuhn. "Public and Private Efforts for the National School Lunch Program," *Food Review* vol.19, issue 2 (May-Aug.1996), USDA, Economic Research Service.

Food Assistance Program [TEFAP]).

- The farm value of domestic food assistance programs has grown steadily. However, Commodity Credit Corporation (CCC) outlays for com-

modity programs, which support farm prices and incomes, have varied widely and trended downward overall. In 1995, the farm value of food assistance programs exceeded CCC outlays for the first time.



NATURAL RESOURCES AND THE ENVIRONMENT

S u m m a r y

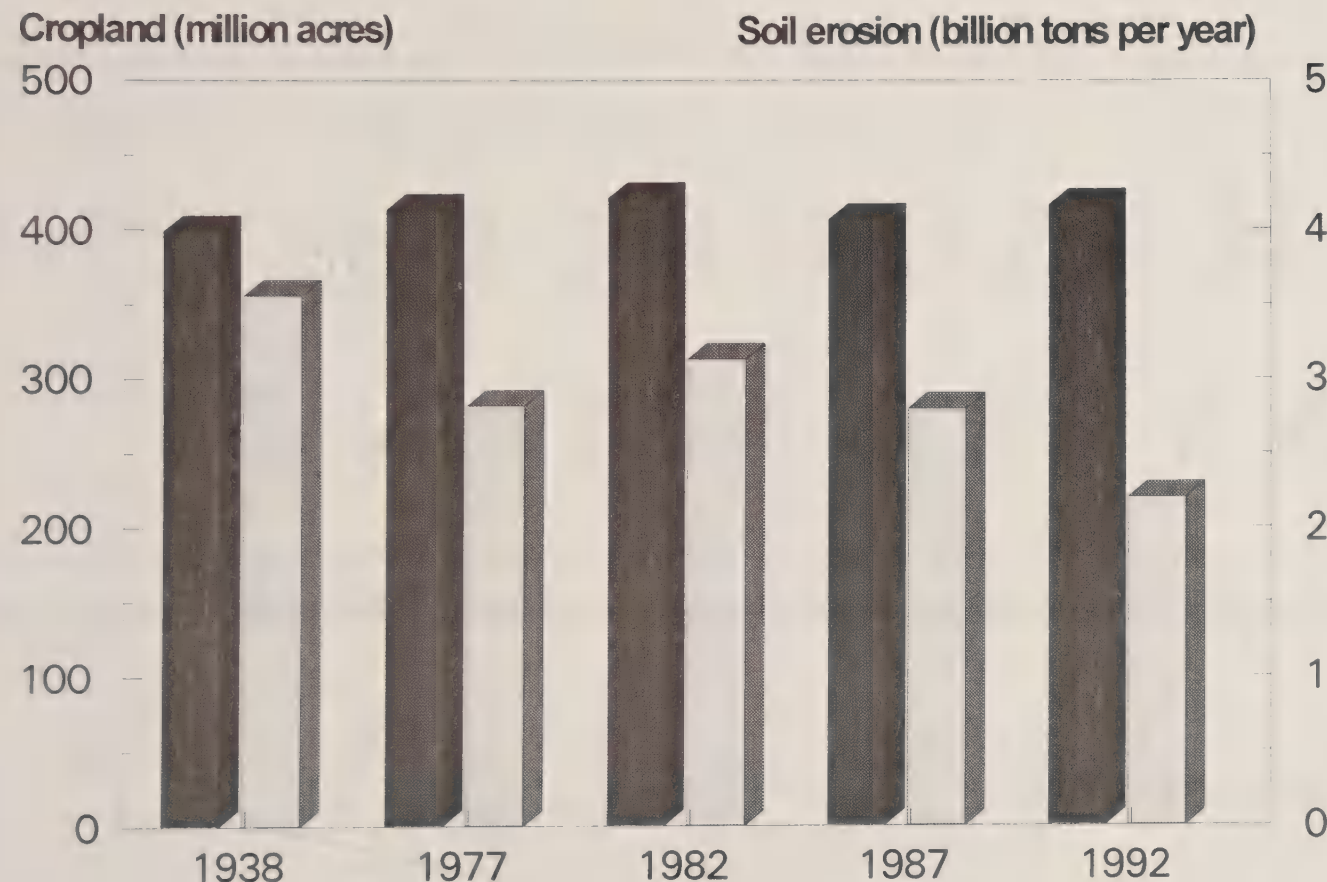
T*rends over the past few decades show that U.S. agriculture's impact on the environment and natural resource use has lessened.*

These trends accelerated in the 1980s. Falling prices for agricultural commodities and reduced demand for agricultural production (and therefore natural resource use) contributed to this trend. Several components of the 1985 Farm Act also accelerated the trend. In addition, fueled by public

research, productivity growth has allowed the farm sector to produce more with less.

Despite these improvements, there are many reasons to expect further environmental demands to be placed on agriculture.

Cropland Stable but Soil Erosion Declining



Cropland Use and Soil Erosion

- Cropland use has been remarkably stable over the last 40 years. Cropland idled through farm programs has varied widely from none up to 20 percent of total cropland acreage.

- The Conservation Reserve Program (CRP), initiated with the

1985 Farm Act, was the first major program to idle significant acreage for conservation purposes.

- Soil erosion has declined by an estimated 40 percent since 1938 with most of the decline realized after 1982. The trend was accelerated by the 1985 establishment of the CRP and the Conservation Compliance

provisions of the commodity programs, which required farmers to employ conservation measures in exchange for farm program payments.

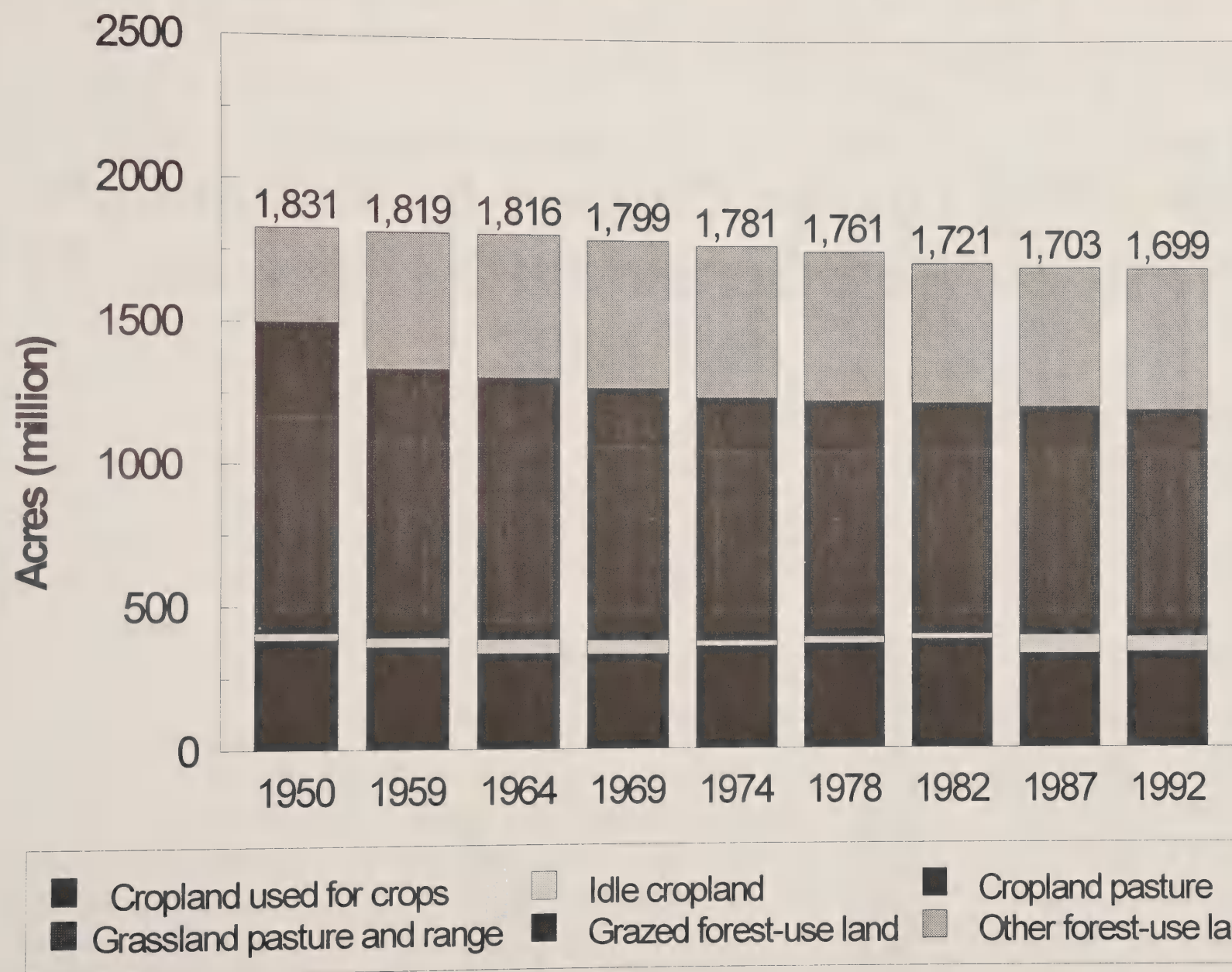
- Why is government policy needed to assure optimal soil conservation? Early programs were premised on lack of information, leading to failure of farmers to protect soil productivity. Now the greatest emphasis of federal policy is on reducing the offsite damages to rivers, lakes, and estuaries stemming from agricultural production. These offsite effects are the result of the failure of market signals to provide adequate producer incentives to protect water quality.

U.S. Land Use

- Forest, grazing and cropland use has been relatively stable since 1950.

- The largest change in land use has been a reduction of grazed forest land and consequent increase in other forest land.

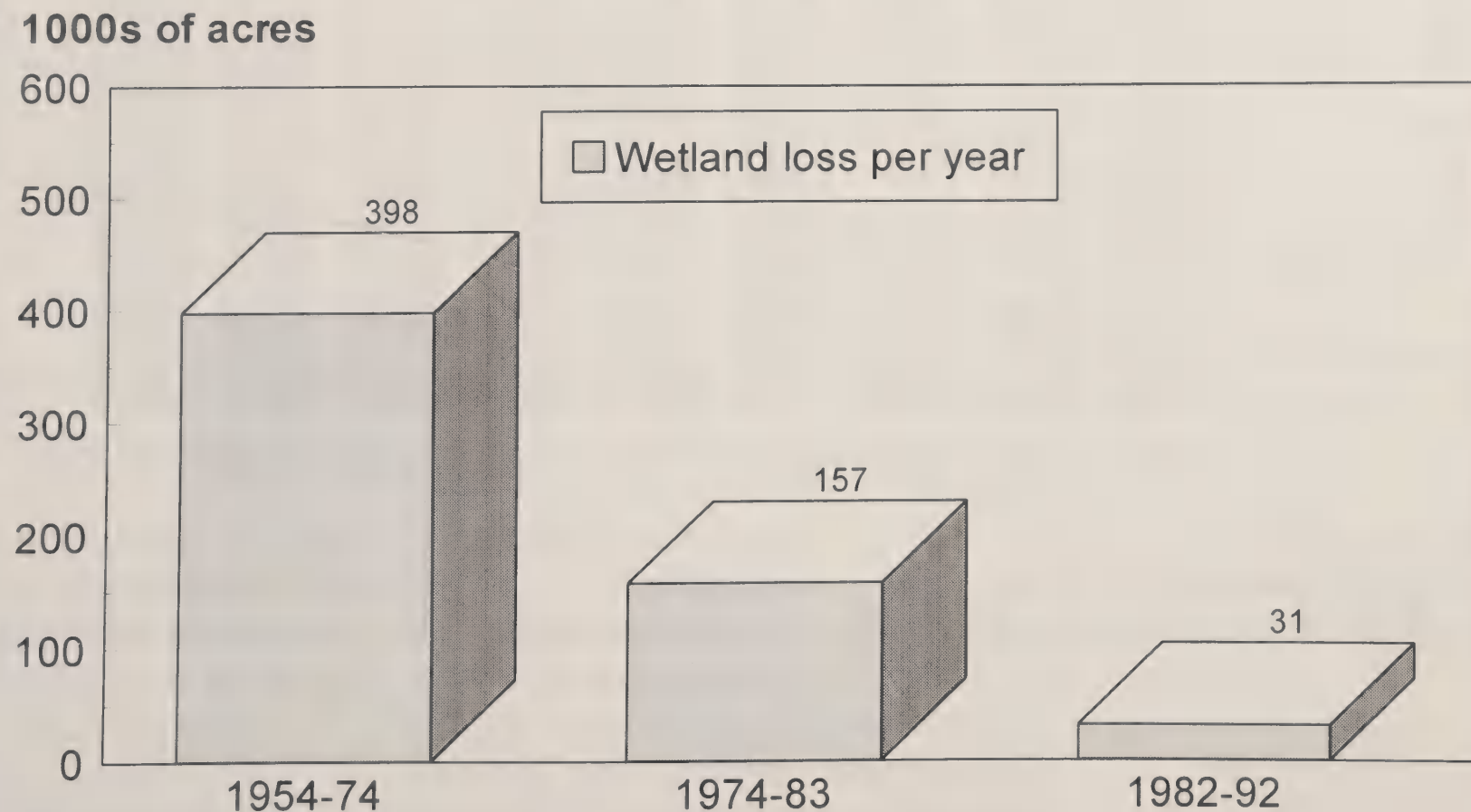
U.S. Land Use, 1950-92



Wetland Losses From Agriculture

- Agriculture continues to contribute to wetland loss, although rates of wetland loss in the 1980s are dramatically lower than in earlier decades.
- Less favorable economics for wetland conversion plus the Swampbuster component of the 1985 Farm Act contributed to this reduction. The Swampbuster provisions discourage the conversion of natural wetlands areas to cropland by linking farm program payment eligibility to wetland protection.

Wetland Losses Caused by Agricultural Activity Slowed Considerably Between 1954 and 1992



Pesticide Use in U.S. Agriculture

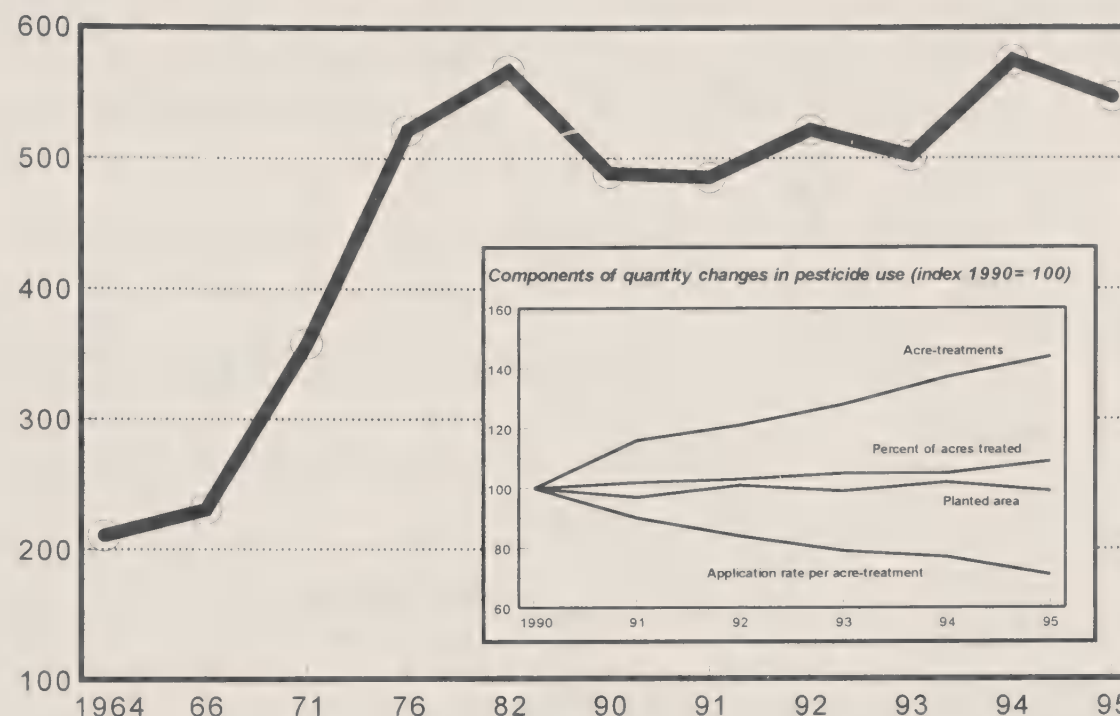
- Agricultural use of pesticides accounts for about 80 percent of all pesticide use in the United States. The simplest and most common indicator of pesticide use is a measure of aggregate weight of applied active ingredients. However, because of the diverse characteristics of pesticide ingredients (toxicity, persistence, solubility, etc.) total quantity is not necessarily a good indicator of environmental or health risk. There has been a significant shift in U.S. agriculture away from chemicals that persist in the environment for very long periods of time, like DDT, to chemicals that degrade much faster. Also there has been a shift to chemicals that are much more concentrated and can be applied at very low rates.

- Pounds of pesticides used in agriculture peaked around 1980-82 and declined after 1982 as a result of lower commodity prices. In recent years, total pesticide use has edged back up and now equals the previous peak. Trends vary, however, among major pesticide classes. The use of herbicides, which accounts for the largest share of pesticides, trended

Pesticide Use For Selected Crops, 1964-95

After a decade of decline, pesticide use has now regained its 1980-82 peak

Million pounds of active ingredient



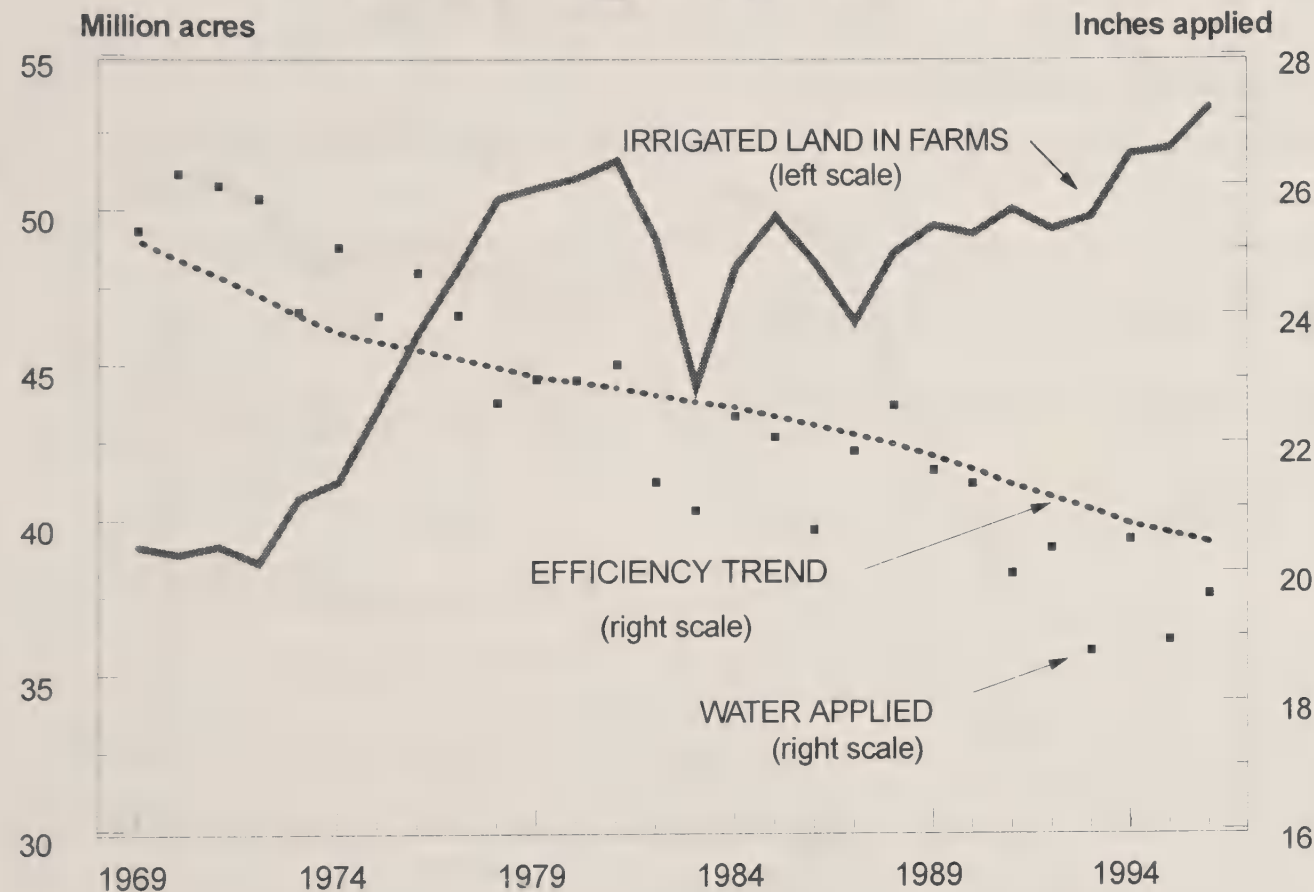
Includes corn, cotton, soybeans, wheat, fall potatoes, other vegetables, citrus, and apples (about 67% of U.S. cropland).

slightly downward during the 1990s. The use of insecticides, fungicides, and other pesticides increased.

- Changes in pesticide quantities reflect changes in planted acreage, share of acreage treated with pesticides, number of ingredient applications per treated acre (acre-treatments), and changes in

application rates per acre-treatment. Since 1990 there has been a substantial increase in acre-treatments, but also a significant decline in the quantity of pesticide applied with each treatment--the net effect being a small increase in total pounds of use.

U.S. Irrigation Trends



Water Use in U.S. Agriculture

- Irrigated area in U.S. agriculture increased by one-third during the 1970s and has begun increasing again in the 1990s. However, since 1970 water use per acre has declined by almost 20 percent. Improved irrigation efficiency has been a major con-

tributor to reduced use per acre. Expansion of irrigated acreage in less arid regions where rainfall is more often sufficient has also contributed to an average decline.

- In fact, since 1980 total water use in irrigated agriculture has declined in the U.S.

The Environment Will Be An Important Issue in the Coming Decades

- Attaining environmental improvements and conserving resources were relatively easy during the 1980s when commodity markets were slack, demand was low, and land prices and rents were down. Will this continue?

- The environment is a growth sector. Rising incomes, a growing population, and greater knowledge about natural resources and the environment increase the demand for--and value placed by society on--environmental goods.

- Furthermore, many aspects of the natural environment that society values are "stocks" depleted through use or conversion. Agriculture is a dominant user of several important environmental assets (wetlands, water, land). Preservation and improvement of environmental quality will not be possible without a substantial contribution from agriculture.

Environmental Improvements Were Relatively Inexpensive in the 1980s

- During the period 1930-95, real land prices grew at about 0.8 percent per year. Although land prices rose rapidly during the 1970s, reflecting high commodity demand and prices,

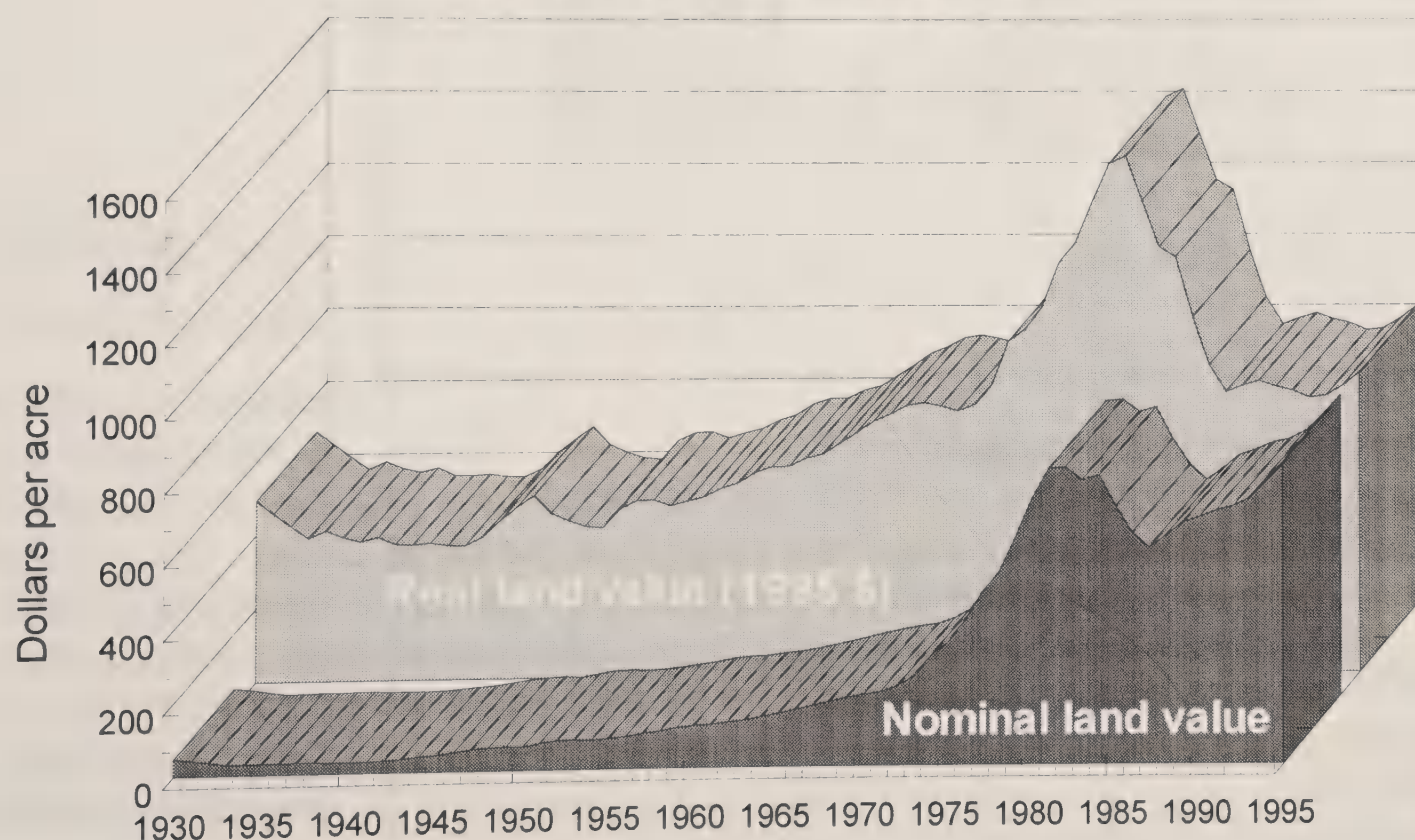
they declined by nearly half between 1981 and 1987 as commodity prices fell.

- With low land prices and rents, per acre federal payments required to induce farmers to enroll idled cropland--or cropland planted to conserving uses such as cover crops--in the

Conservation Reserve Program were relatively low.

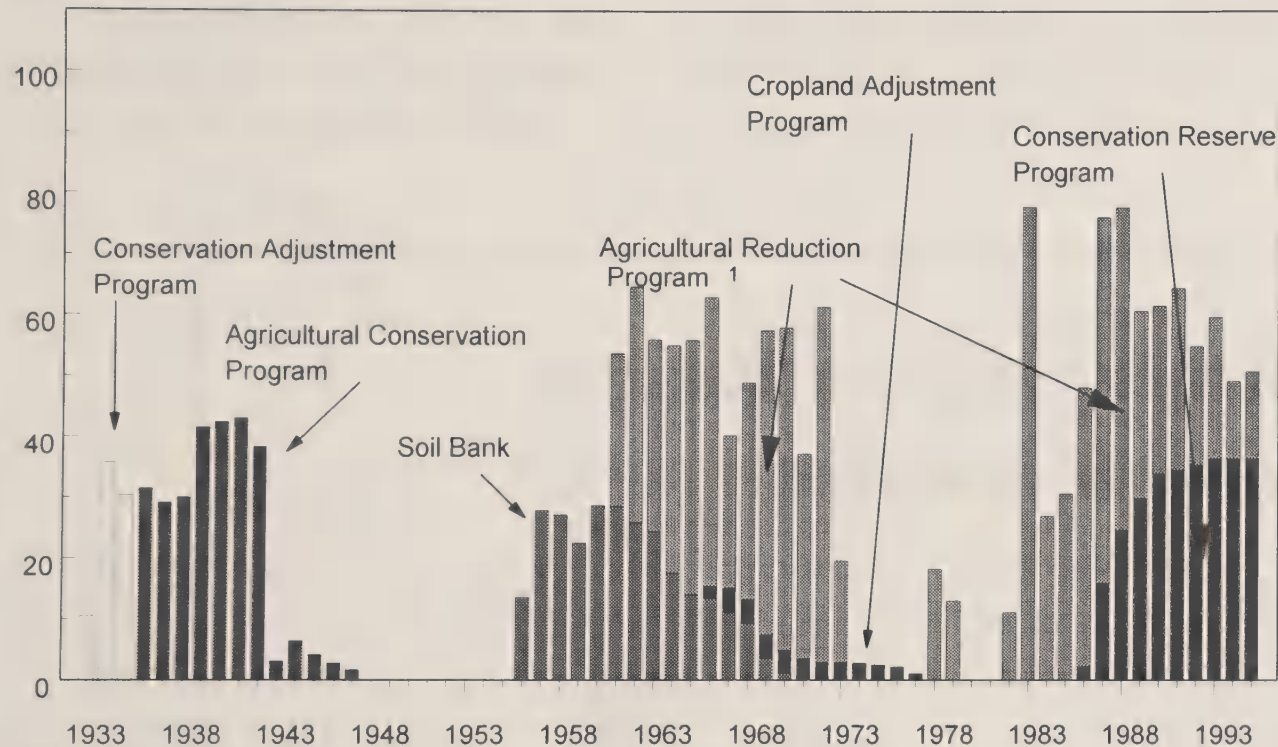
- However, when export demand and commodity prices rise, conservation programs become more expensive and the tradeoff between international competitiveness and conservation becomes more apparent.

U.S. Agricultural Land Values: Nominal and Real



Cropland Acreage Reductions by Type of Program, 1933-95

Million acres



¹ Includes Acreage Conservation Reserve, 0,50/85-92 Programs, Paid Land Diversion, and Payment-In-Kind programs in applicable years.

Commodity and Conservation Programs Have Worked in Tandem

- Cropland acreage reductions through agricultural programs have been counter-cyclical: high when commodity prices were low and disappearing when commodity prices

were high.

- Reductions in cropland acreage have neared 80 million acres in some years, as much as 20 percent of total U.S. cropland.
- Environment and conservation programs have reinforced supply control programs that supported

commodity prices. When political support for supply control disappears because of strong market conditions, it is also more difficult to retain political support for environmental programs.

- Although the CRP is the only remaining farm policy program with a supply-control effect on U.S. agriculture, it is administered as an *environmental* program.

For information on U.S. conservation programs...

Nelson, Frederick J., and Lyle P. Schertz, eds. *Provisions of the Federal Agriculture Improvement and Reform Act of 1996*, AIB-729, USDA, Economic Research Service, September 1996.

Osborn, C. Tim. "Conservation and the 1996 Farm Act," *Agricultural Outlook*, USDA, Economic Research Service, November 1996.

The Environment is a Growth Sector: The Evidence of Increasing U.S. Pollution Control Expenditures

- Total pollution control expenditures in the U.S. economy have grown steadily in real terms since 1972. At their 1992 level (about \$90 billion), pollution control expenditures were nearly equal to the level of GDP in agriculture, forestry, and fisheries (about \$100 billion).

- Despite their growth, it is likely that pollution control expenditures substantially underestimate the value of the environment to U.S. citizens.

Who Bears the Cost of Pollution Abatement?

- For the overall U.S. economy, most pollution abatement costs are borne by the private sector.

- In the case of agriculture, and in contrast to other sectors in which the "polluter pays," most costs for pollution abatement and conservation are borne by Federal and State governments through technical assistance and easement programs.

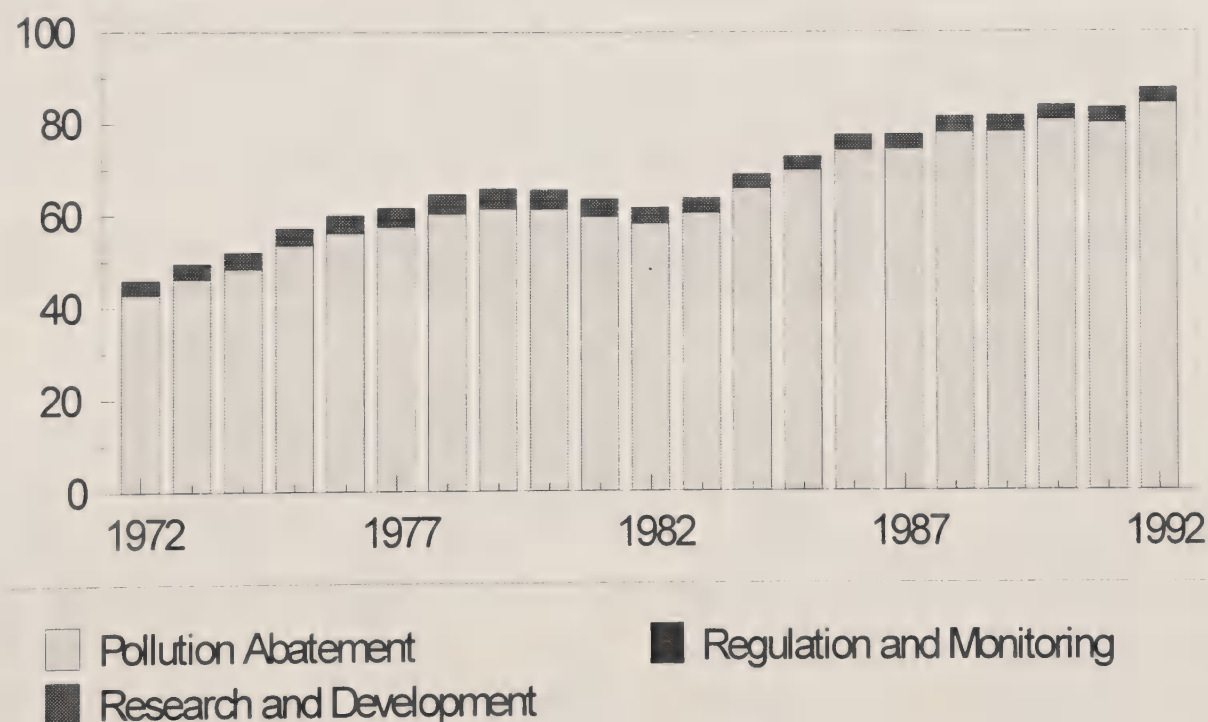
On the economics of Integrated Pest Management programs:

Lynch, Sarah, Cathy Greene, and Carol Kramer-LeBlanc, eds. *Proceedings of the Third National IPM Workshop: Broadening Support for 21st*

Century IPM, Miscellaneous Publication 1542, USDA, Economic Research Service, May 1997.

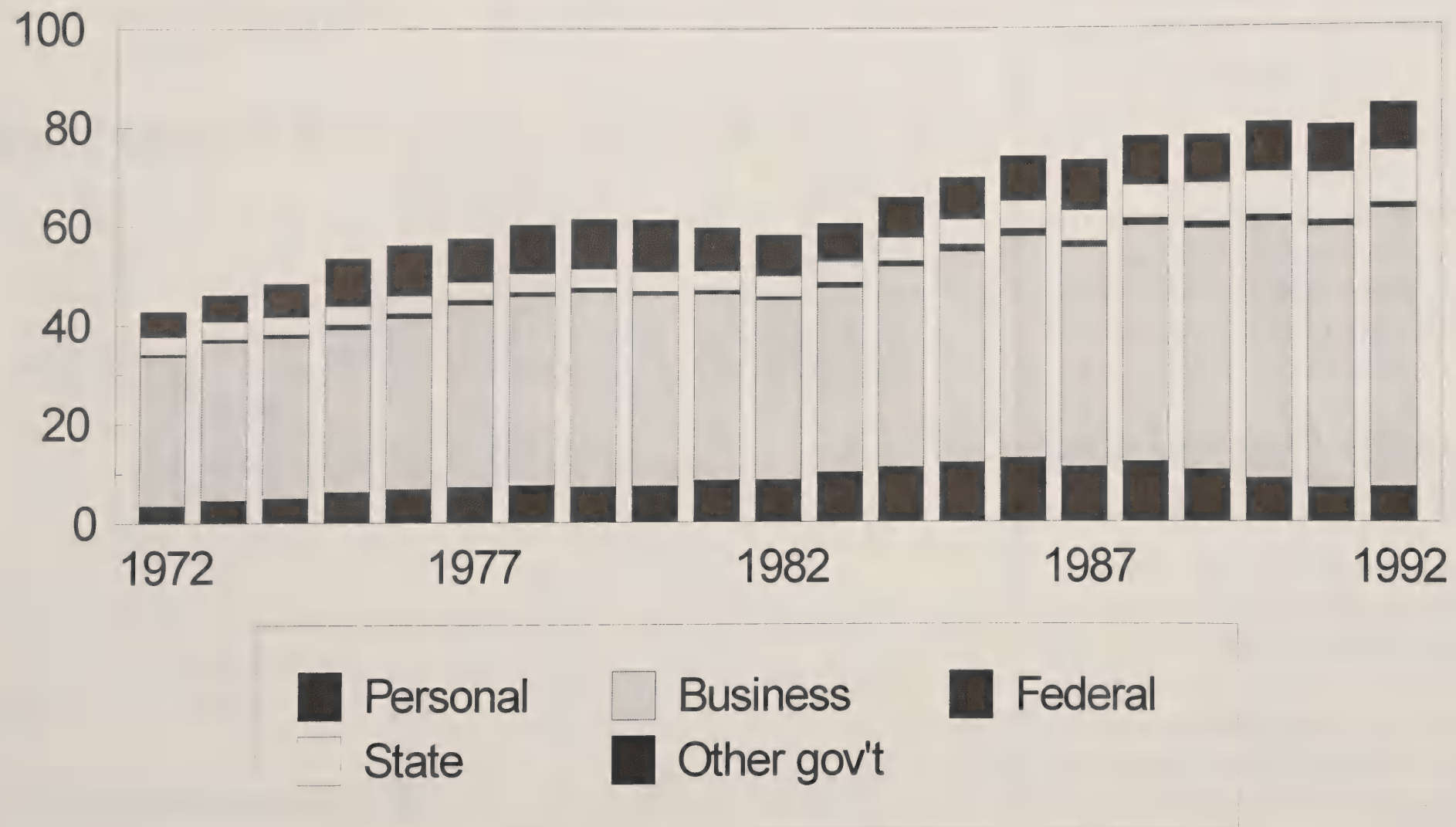
U.S. Total Pollution Control Expenditures

Billions of 1987 dollars



U.S. Total Pollution Abatement Expenditures

Billions of 1987 dollars



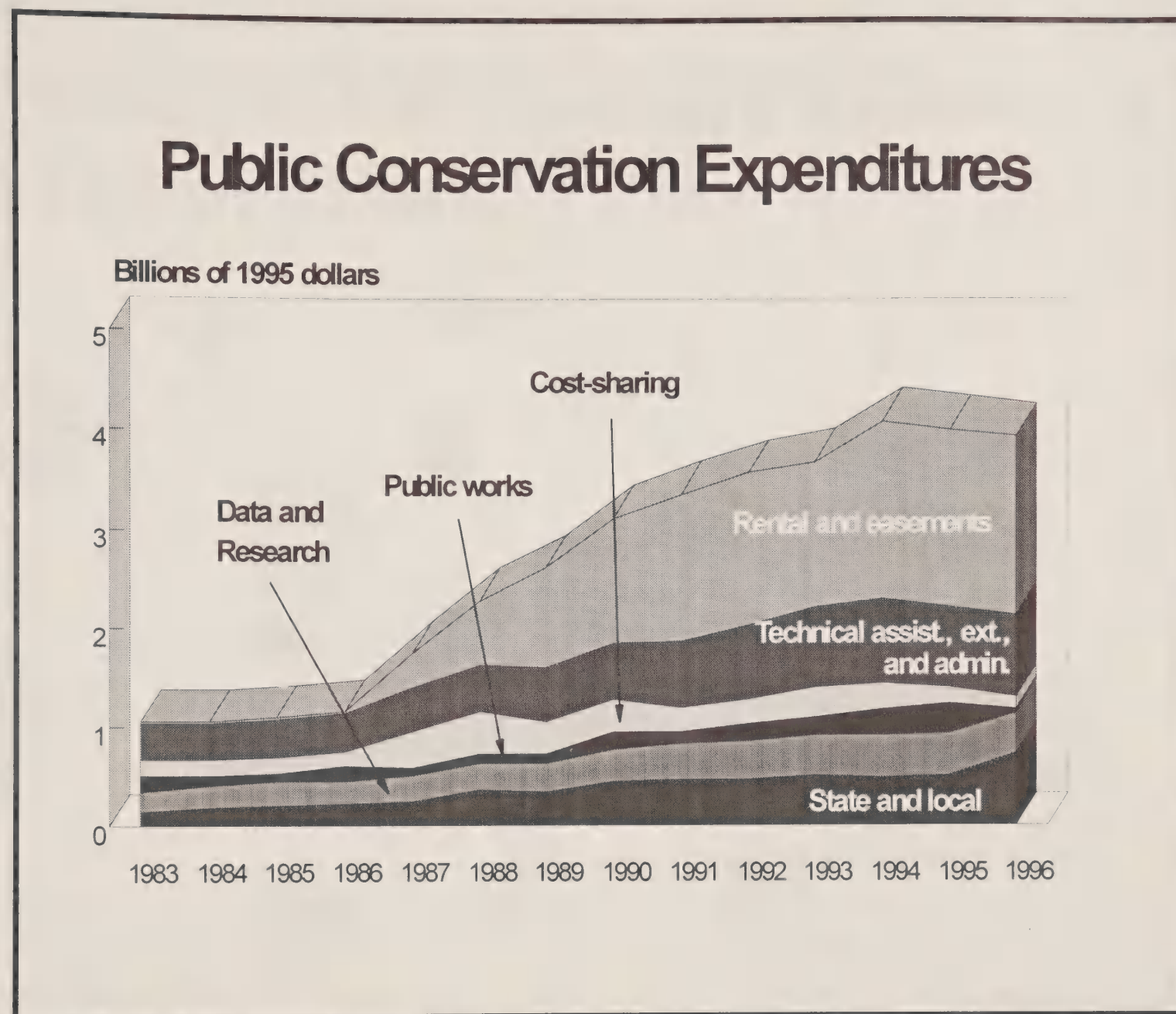
- In constant 1995 dollars, conservation expenditures for U.S. agriculture grew from about \$1 billion in 1986 to just over \$4 billion in 1994. Expenditures in 1995 and appropriated funds in 1996 declined slightly from the peak in 1994.

- Rental and easement payments grew most rapidly and are now the largest share of public expenditures for agricultural conservation. In real terms, other conservation expenditures have remained relatively constant.

- Leveling of funding makes it increasingly important to target programs effectively for maximum environmental benefit. This is important for both easement and technical assistance/cost sharing programs.

Environmental Assets Are Increasingly Scarce: The Case of Wetlands

- Almost one-half of all wetlands in the lower 48 states have been lost since 1780. Most of the original and remaining wetlands are in the Southeast, Mississippi Delta, and Great



Lake states. Nearly 90 percent of the original wetlands in the Corn Belt have been lost, as have nearly three-quarters of the wetlands in the Pacific states and about one-half in the Plains states.

- The social value of wetlands varies widely depending on their relationship to key ecosystems and species and also to wildlife migratory patterns.

U.S. Wetlands: Remaining Extent and Losses

1780 - 1990



Agriculture is a Dominant User of Many Natural Resources: The Case of Irrigation and Water Use

- Most water consumption in U.S. agriculture occurs west of the Mississippi river. In many regions of the western United States, irrigation

accounts for more than 90 percent of water use.

- Irrigation use has been growing in Eastern states in recent years, supplementing usually adequate rainfall.

Suggested readings:

Agricultural Resources and Environmental Indicators 1996-97, Agricultural Handbook 712, USDA, Economic Research Service, June 1997.

Schimmelpfennig, David, Jan Lewandrowski, John Reilly, Marinos Tsigas, and Ian Parry. *Agricultural Adaptation to Climate Change: Issues of Longrun Sustainability*, Agricultural Economic Report 740, USDA, Economic Research Service, June 1996.

Vasavada, Utpal, Jim Hrubovcak, and Joe Aldy. "Incentives for Sustainable Agriculture," *Agricultural Outlook*, USDA, Economic Research Service, March 1997.

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Water Consumption in Irrigation and Other Uses, 1990

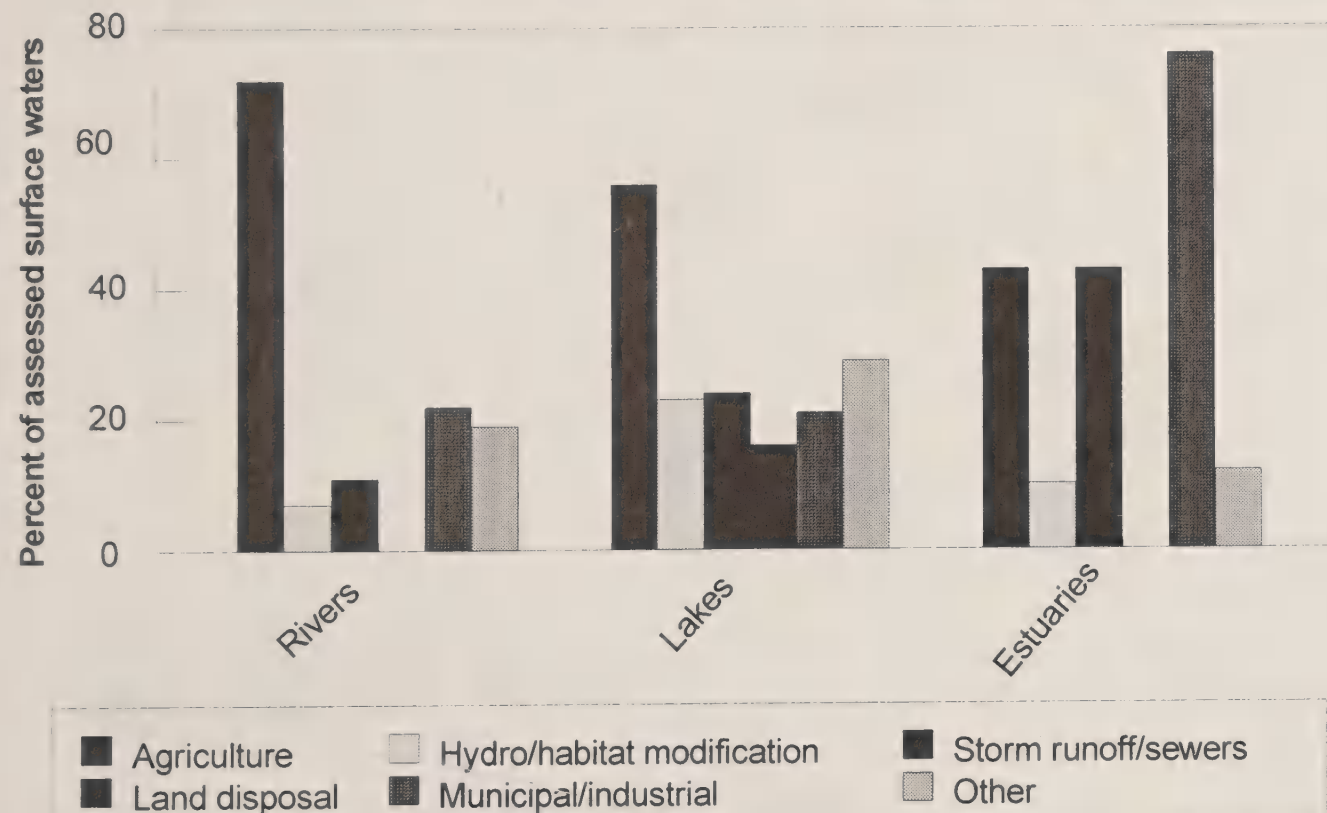


Irrigation

All other uses

Value and corresponding circle size represent maximum consumptive use in million acre-feet.

Sources and Extent of Surface Water Quality Impairment



Agriculture is a Dominant User of Many Natural Resources: The Case of Water Quality

- Agriculture is a source of surface water quality impairment in rivers, lakes, and estuaries.
- Agriculture contributes to

impairment in over 70 percent of river miles, and nearly 60 percent of lake area. Siltation and nutrients, caused partly by runoff from cropland, are the two most important single causes of impairments of lakes and rivers.

- Another source of agricultural related water-quality impairment is runoff from livestock operations.

Suggested readings:

Crutchfield, Stephen R., Joseph C. Cooper, and Daniel Hellerstein. *Benefits of Safer Drinking Water: the Value of Nitrate Reduction*, Agricultural Economic Report 752, USDA, Economic Research Service, June 1997.

Ribaudo, Marc O. "USDA's Water Quality Program: the Lessons Learned," *Agricultural Outlook*, USDA, Economic Research Service, May 1997.

According to the EPA, runoff from confined feedlots caused 7 percent of lake and 13 percent of river impairments in 1990.

- Agriculture is a serious, but not the dominant, source of impairment of estuaries.

AGRICULTURAL RESEARCH, PRODUCTIVITY, AND TECHNICAL CHANGE

S u m m a r y

U.S. agricultural productivity growth has been rapid compared with other sectors of the economy. Agricultural productivity has grown at 1.8 percent per year since 1948 whereas productivity in the non-farm economy grew at only 1.1 percent.

Public agricultural research has been a major contributor to productivity growth and has been a solid public investment, earning a return of at

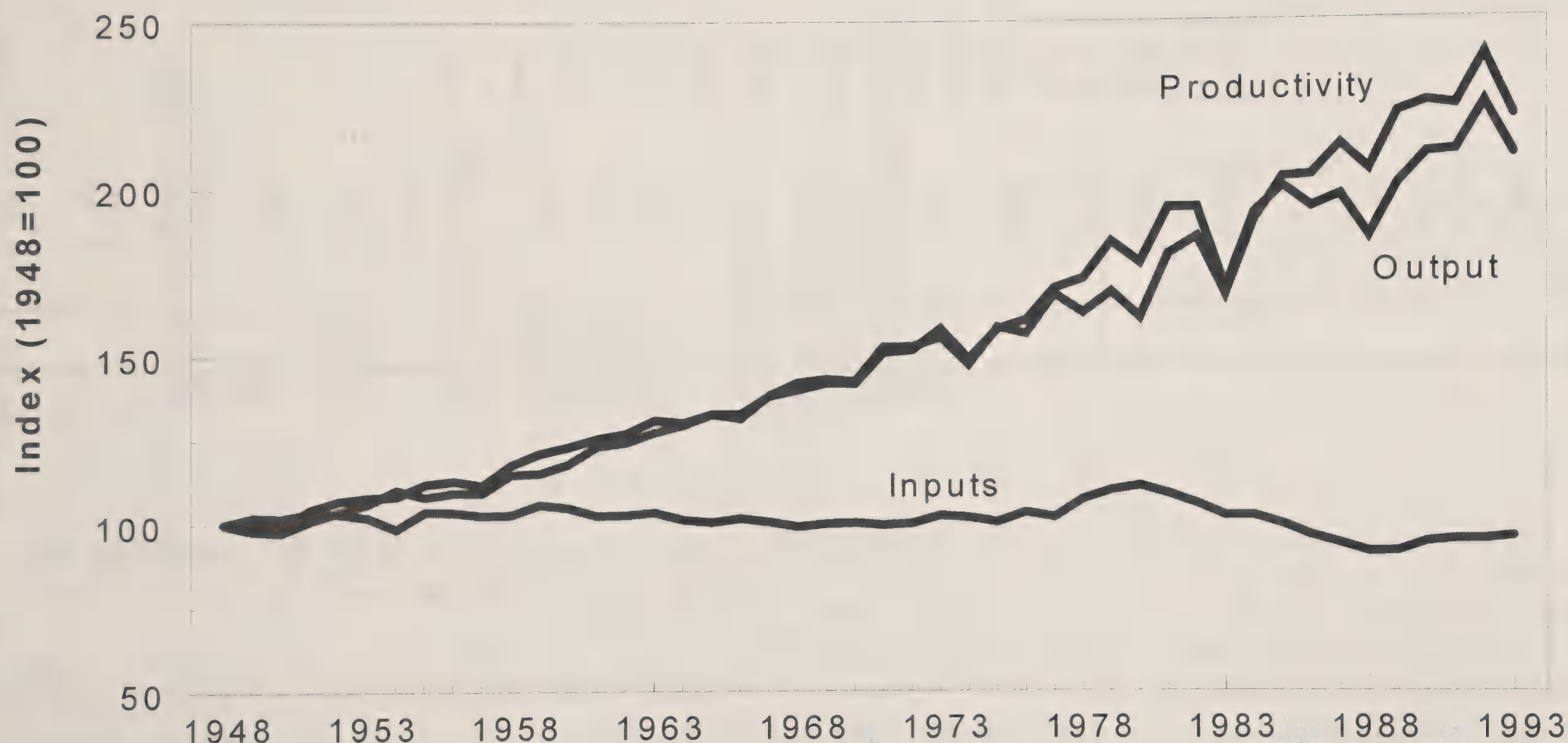
least 35 percent. Private expenditures on agricultural research have grown more rapidly and now exceed public expenditures.

Yield growth in major field crops has been rapid ranging from 1 to 3 percent per year. Yield growth for corn, sorghum, and potatoes has been most rapid. Yield growth for non-hybrid crops has been slower. Some have argued that crop yield growth slowed

in the 1980s but the evidence is mixed.

With little or no increase in public agricultural research expenditures over the past decade and little reason to expect increases in the future, maintaining yield growth and meeting other research objectives will mean better targeting existing public research expenditures and creating incentives for the private sector to fund research.

U.S. Agriculture: Inputs, Outputs and Productivity



Productivity and Agricultural Research

- Productivity in the farm sector has grown at 1.8 percent per year

since 1948 compared with 1.1 percent in the non-farm economy.

- Rates of return to public agricultural research have been high--the

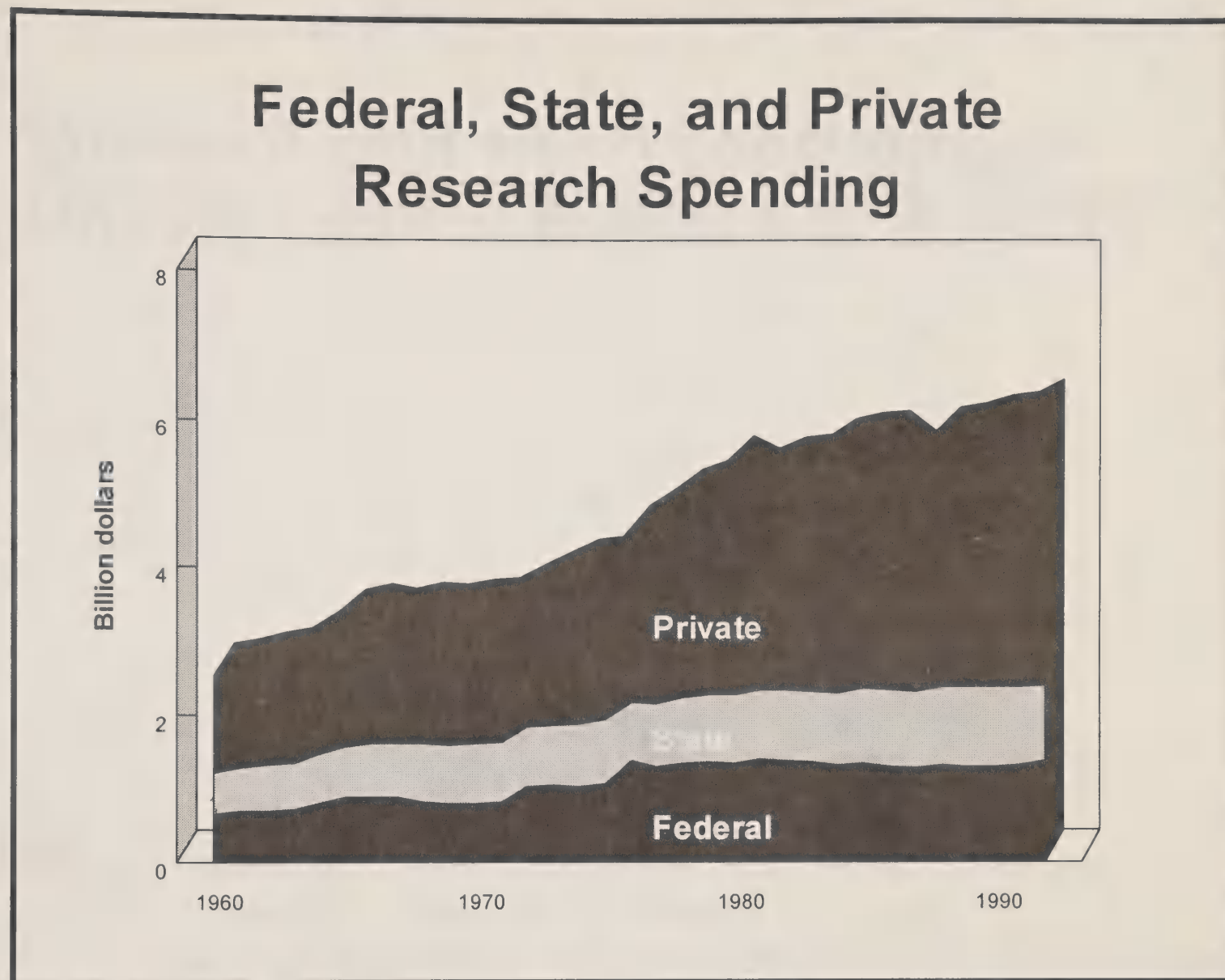
marginal rate is at least 35 percent. One of the major implications is that yield growth has been rapid for major field crops.

Looking Forward: Challenges for Agricultural R&D

- U.S. public agricultural R&D spending has been flat in real terms over the past ten to 15 years. While the evidence is mixed, there is concern whether worldwide yield growth can keep pace with demand. Failure to do so could increase demand for U.S. agricultural production and put significant pressure on natural resource use and the environment.
- R&D spending on natural resource management in agriculture has grown modestly since 1982 in contrast to trends in the general economy.
- Public funding must increasingly be focused on those areas where the private sector will not fund research.

Public Agricultural Research Has Been Stagnant...

...but private sector research has grown rapidly. Since 1980, more than half of all agricultural research funds are from the private sector.

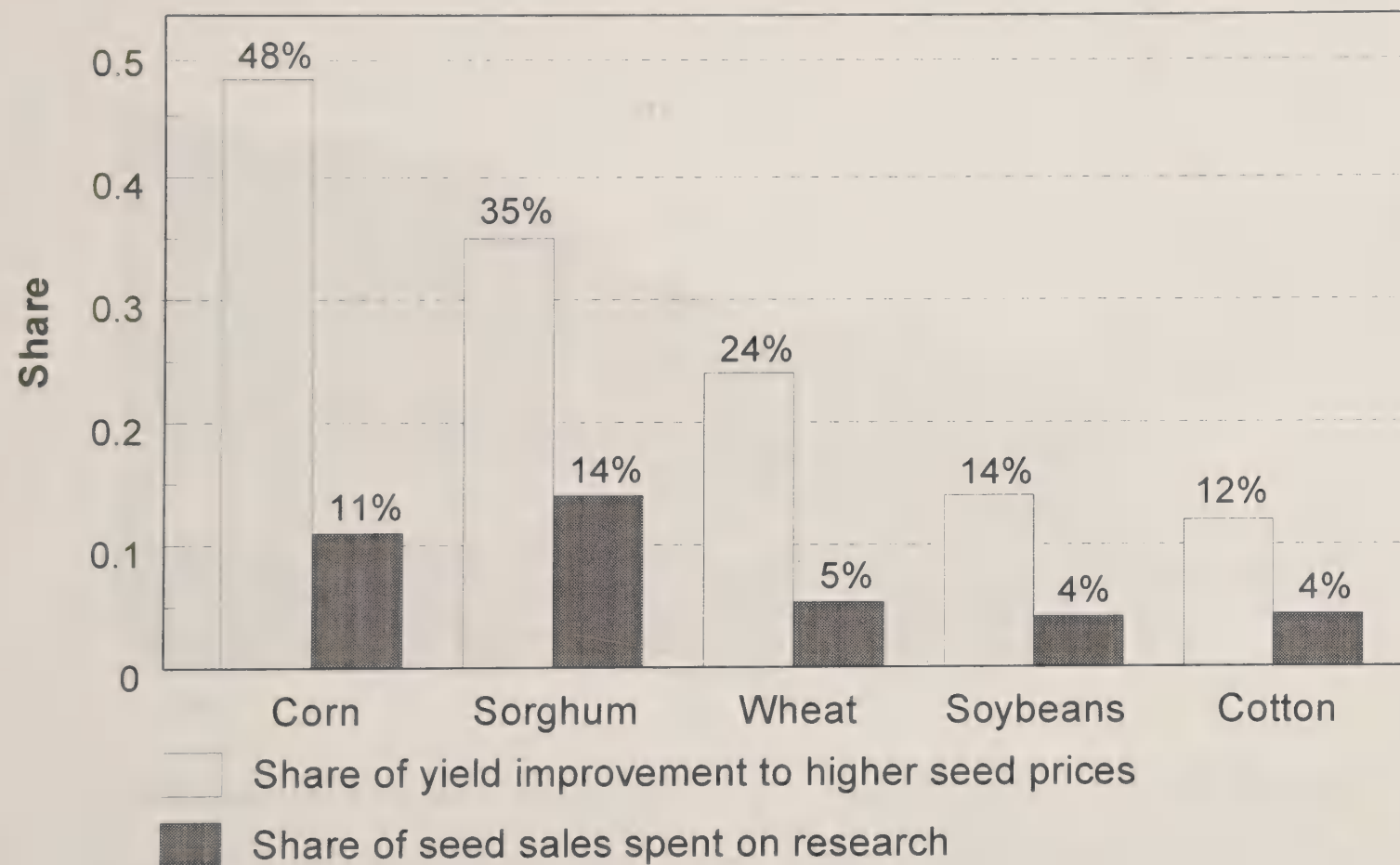


- Public (federal plus state) agricultural research expenditures grew in real (inflation-adjusted) terms by 3-4 percent per year before 1980, but yearly growth has slowed to less than 1 percent thereafter. Federal expenditures have been stagnant since 1976.

Incentives for Private R&D Investments are Increasingly Important to Agriculture's Future

- For crops grown with hybrid seed, such as corn and sorghum, seed companies have been able to capture between one-third and one-half of the

Appropriating Gains from Research: Private Investment in Plant Breeding



- Patenting of biological inventions and changes in the U.S. Plant Variety Protection Act may increase private incentives.

Crop Yield Trends are of Increasing Concern

- Yield growth has been rapid for major field crops. Since 1939, corn yields have grown about 3.0 percent and wheat yields about 1.8 percent per year.
- Yield growth for hybrid crops, where private research incentives have been stronger, have been

value of improved varieties by charging higher seed prices.

- For crops grown from non-hybrid varieties, such as soybeans, cotton, and wheat, seed companies appear to be capturing less than one-

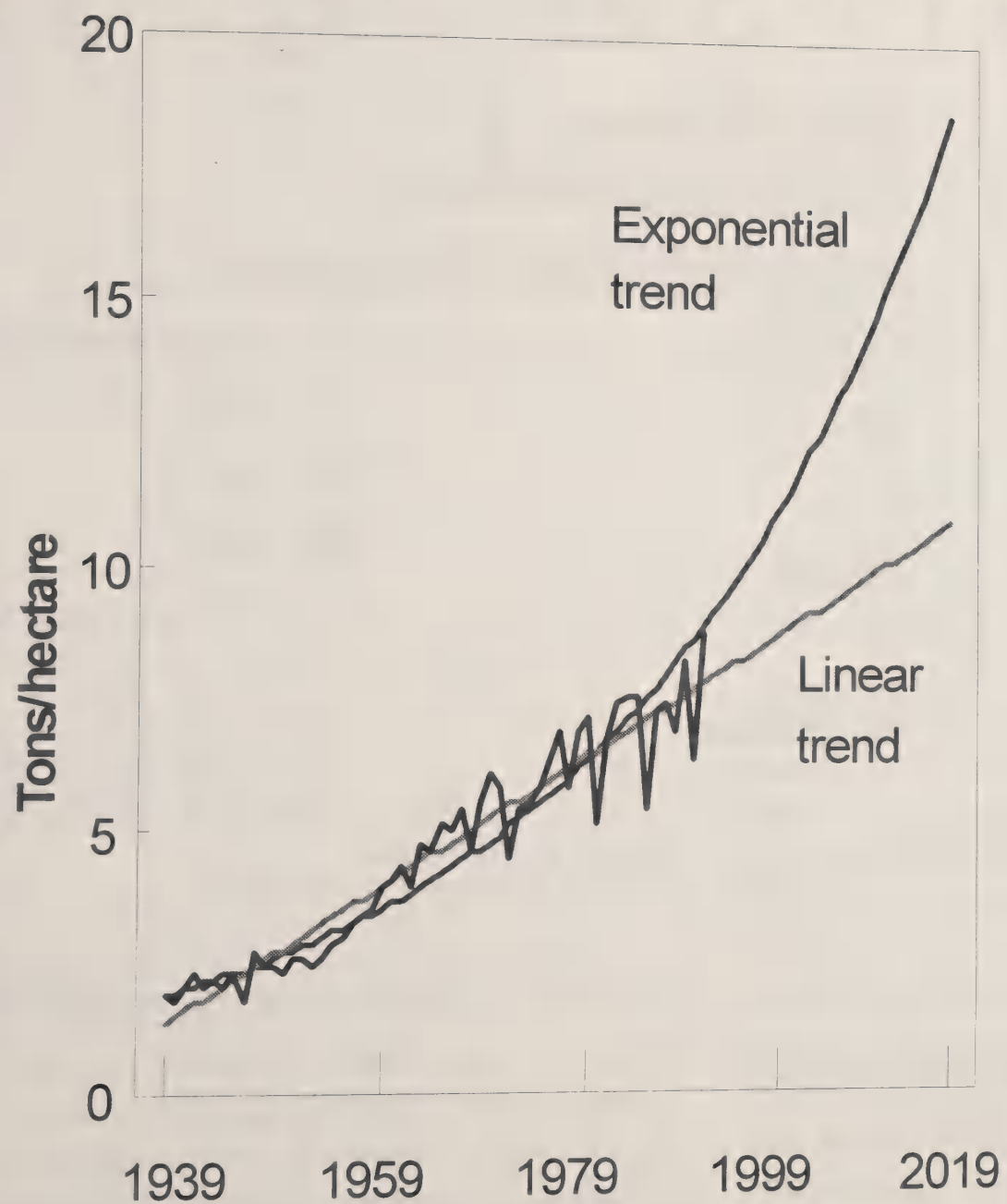
fourth of the gains from plant breeding.

- Evidence suggests that only about 5 percent of the value of seed sales is reinvested in research.

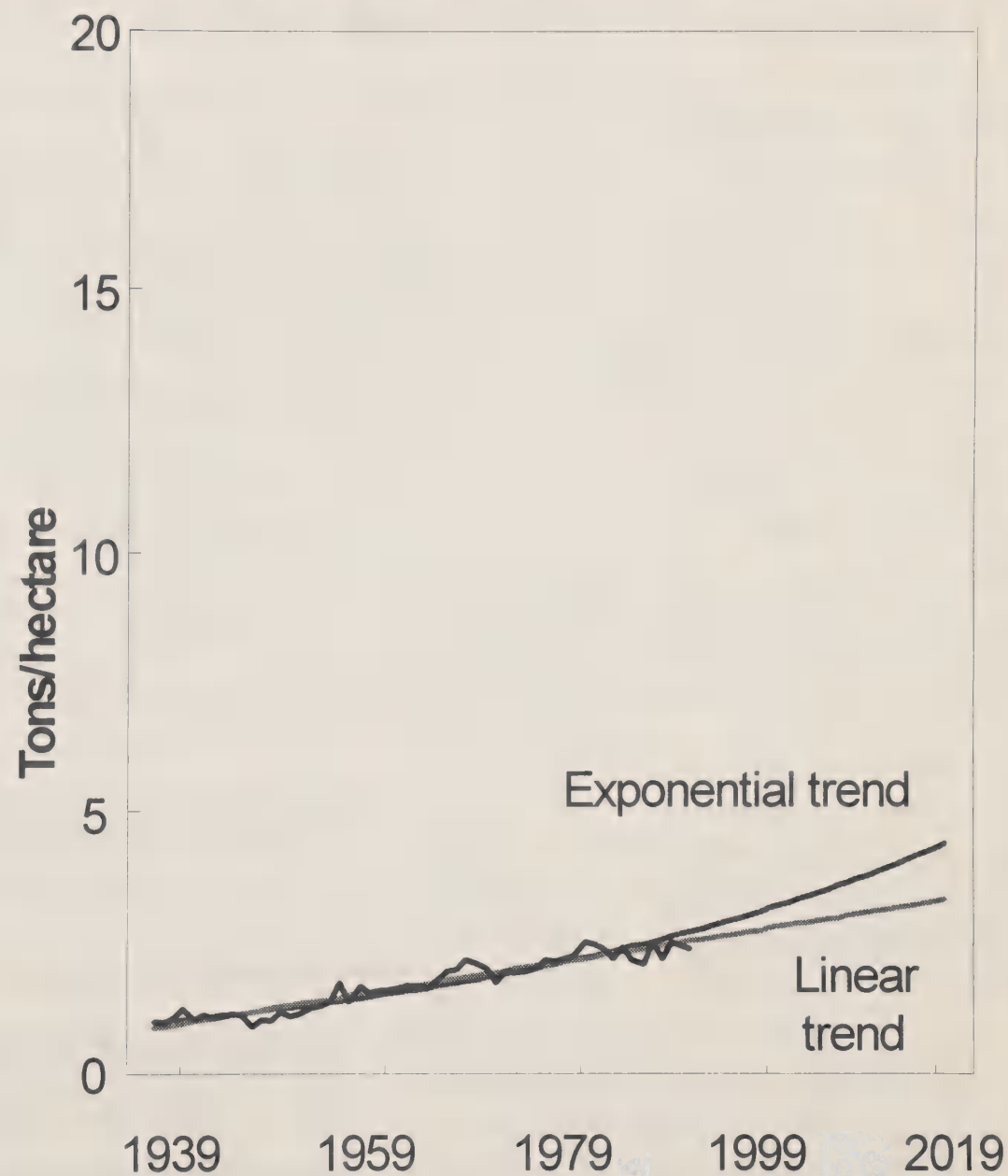
faster.

- There is no strong evidence of a yield plateau for major field crops, but is also unclear whether yields are rising at a linear or exponential rate.

U.S. Corn Yield Trends



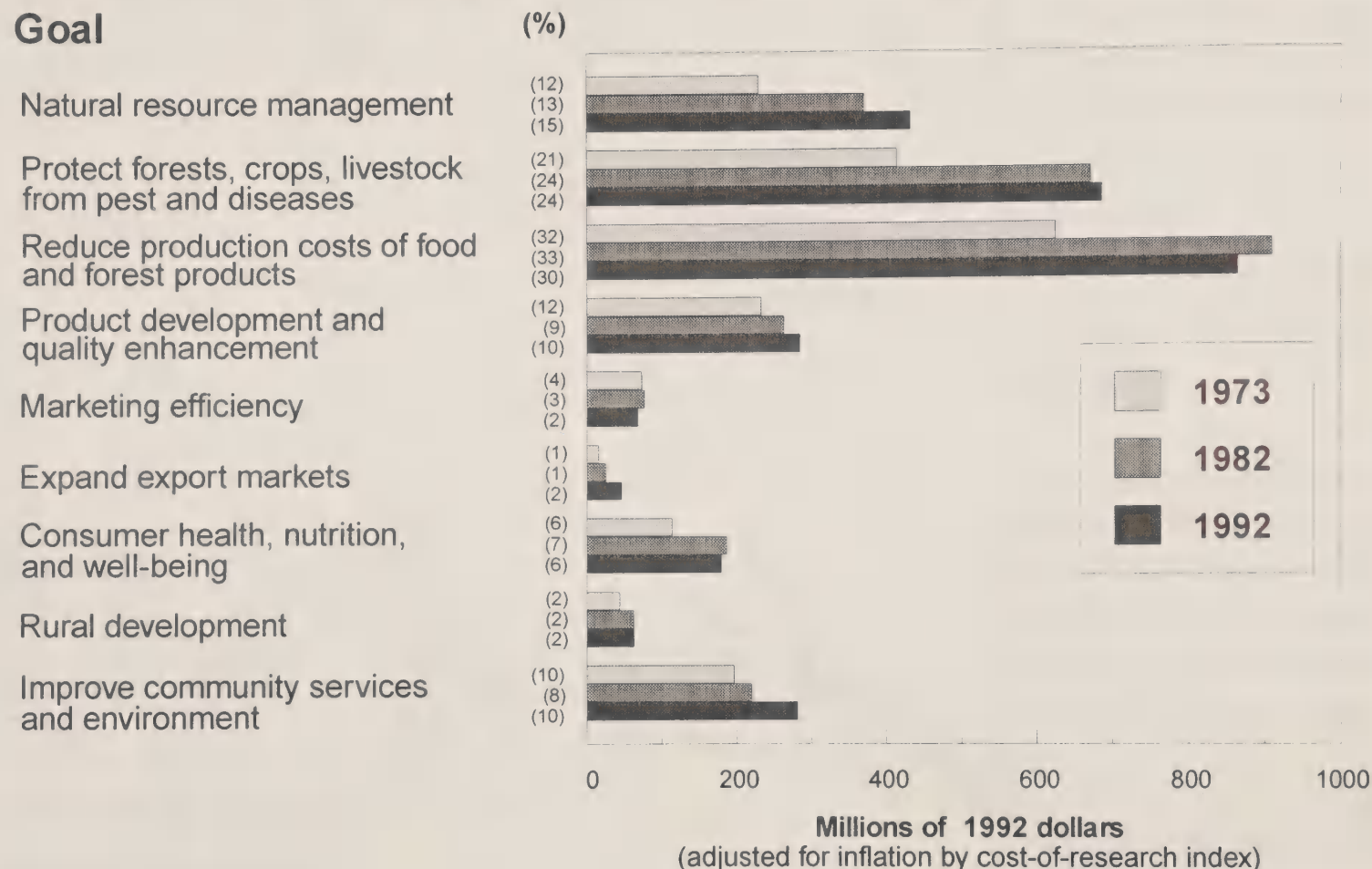
U.S. Wheat Yield Trends



R&D Spending on Natural Resources in Agriculture Has Increased

- Research expenditures by the U.S. federal-state agricultural research system are allocated into nine broad goals.
- Allocation among the nine goals has remained fairly constant over the past twenty years. More than 70 percent of research is spent for the first three goals (see graph).
- Expenditures for natural resource management have increased modestly in real dollars and as a share of total R&D.

Allocation of Public Expenditures for Agricultural Research



Suggested reading on the U.S. system of agricultural research:

Fuglie, Keith, Nicole Ballenger, Kelly Day, Cassandra Klotz, Michael

Ollinger, John Reilly, Utpal Vasavada, and Jet Yee. *Agricultural Research and Development: Public and Private Investments Under Alternative Markets and Institutions*, Agricultural Economic Report 735, USDA, Economic Research Service, May 1996.

U.S. AGRICULTURE AND WORLD TRADE

S u m m a r y

Trade matters for U.S. farm income, commodity and food prices, and food variety. Export revenues account for more than one quarter of U.S. farm income.

Economic development, particularly in Asia, is a major factor driving the level and composition of U.S. agriculture and food exports. In response to the changing composition of global export demand, U.S. high-value product (HVP) exports surpassed U.S. bulk commodity exports in 1991.

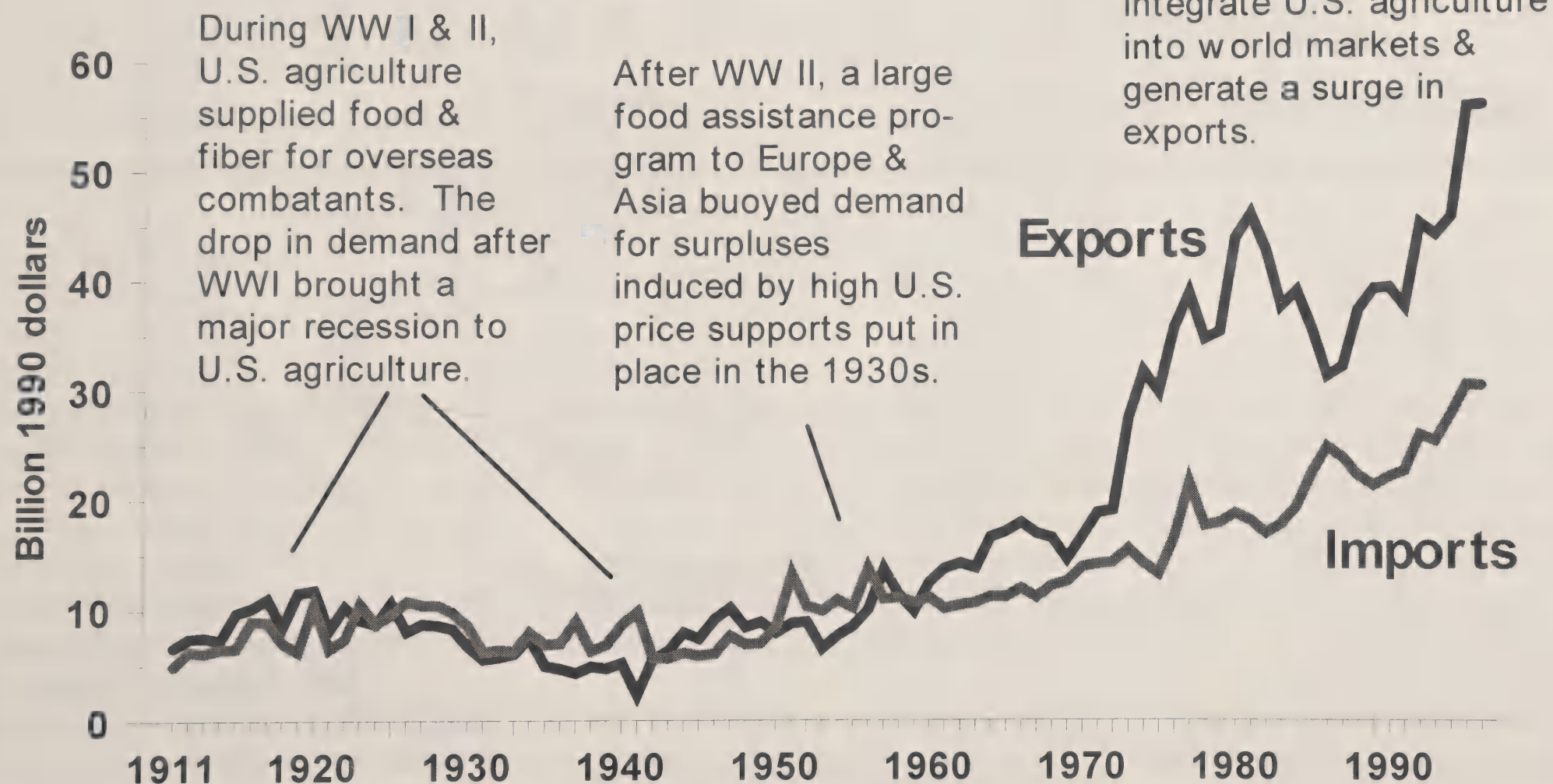
Multilateral and bilateral market-opening negotiations continue to be important. Sanitary and phytosanitary measures, other technical barriers to trade, and state trading are trade policy issues that concern U.S. agricultural exporters and policymakers.

Uncertainties that affect the future of U.S. agricultural and food trade include the future role of China in international markets, the changing structure of the European Union, the expansion of regional trade agree-

ments in Asia and Latin America, and the role of foreign direct investment versus exports as a means of expanding U.S. sales.

The U.S. trade policy agenda is changing in response to the changing composition of global agricultural and food product markets. Of increasing interest are: sanitary and phytosanitary issues; marketing and handling issues; overcoming infrastructural impediments faced by perishable products; market development policy; and investment policy.

U.S. Agricultural Trade Has a Long and Important History

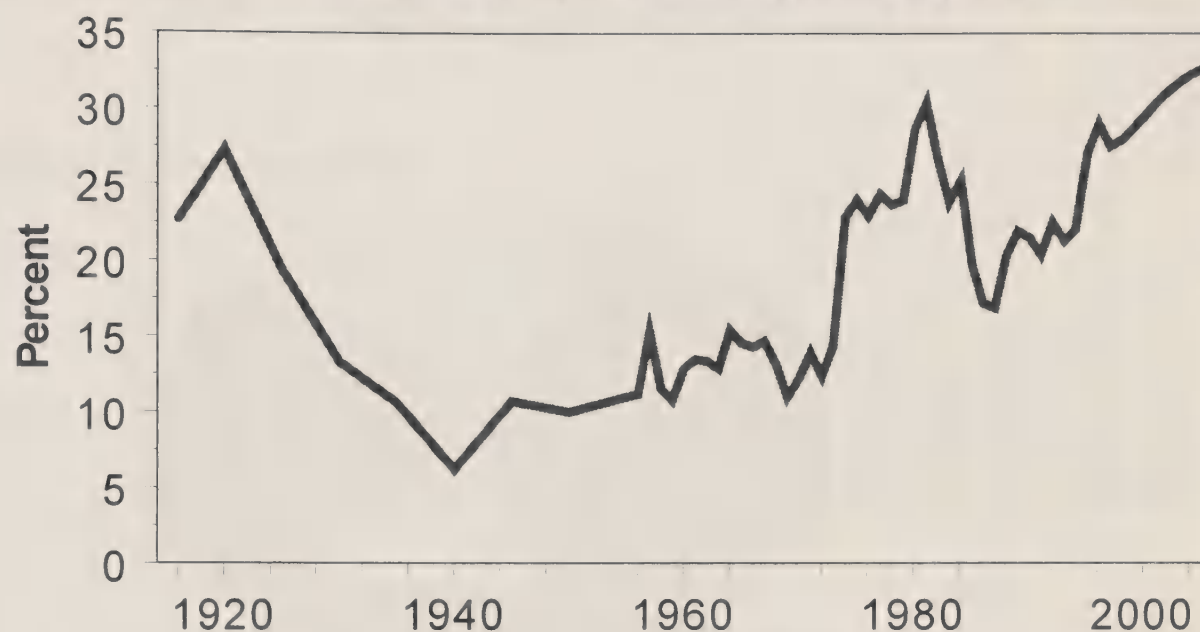


U.S. Agricultural Exports

- U.S. agricultural exports declined in the 1980s, but policy initiatives--the completion of the Uruguay Round, the North American Free Trade Agreement (NAFTA), and changes in U.S. farm policy--have since combined with strong income growth in key regions to create a favorable environment for U.S. trade.
- Trade opportunities are of essential importance for U.S. agriculture. With the productivity of U.S. agriculture growing faster than domestic food and fiber demand, U.S. farmers and agricultural firms rely heavily on export markets to sustain prices and revenues.
- Recently agricultural exports have accounted for about 25 percent of gross cash receipts (not including farm program payments). For some commodities, 'trade dependency' is considerably higher. Over the last few decades, wheat exports have averaged 55 percent of total wheat disappearance. Shares of rice and cotton production going to export markets have averaged 40 percent or more in recent years.

U.S. Agriculture Now Depends on Trade

Trade share of gross cash receipts



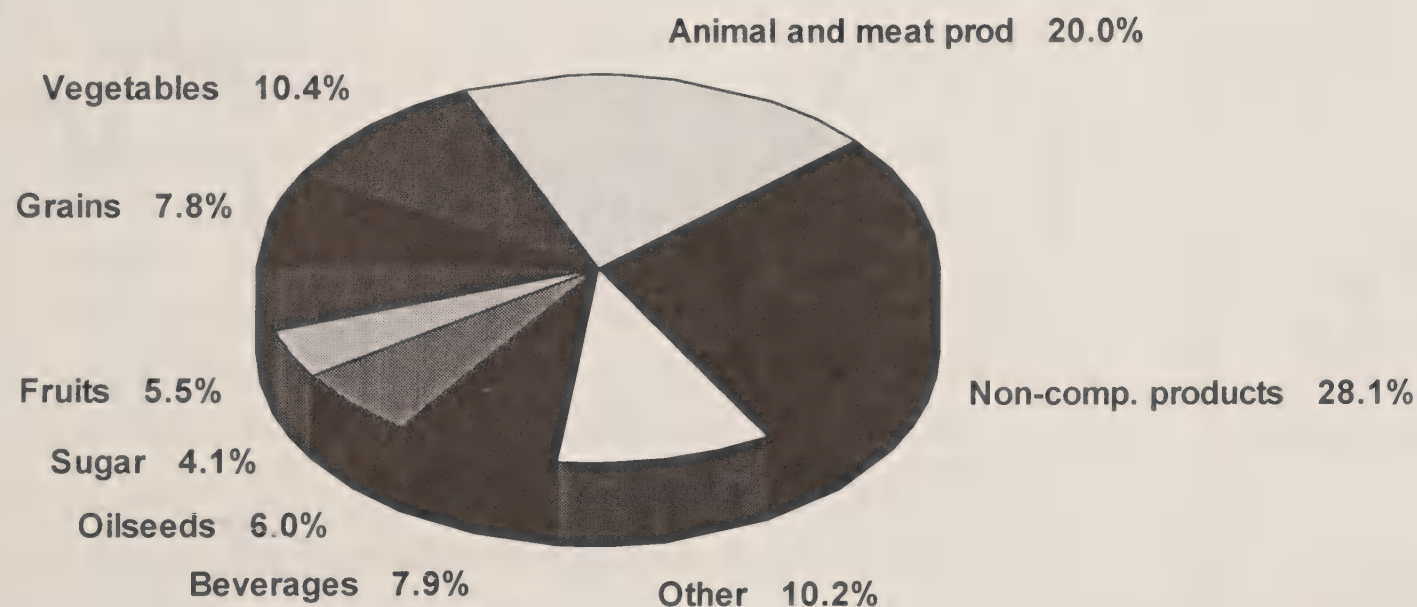
Note: Agricultural exports/Gross cash income less government payments

For a graphical presentation of the market outlook for U.S. agricultural commodities:

See the Agricultural Baseline projection briefing room on the ERS Home Page:
<http://www.econ.ag.gov/>

Consumers Also Benefit From Trade

Agricultural imports totaled \$29.9 billion in 1995



Source: U.S. Agricultural Trade Update, March 1996

- Imports expand food variety, stabilize year-round supply of fresh fruits and vegetables, and temper increases in food prices. Almost one-third of total agricultural and food imports are "non-competitive" imports. These are foods not produced in most of the United States, like coffee, chocolate, and tropical fruit. Other food imports reflect consumer preferences for foods differentiated by origin and quality, like

U.S. Consumers and Agricultural Trade

- Trade is also important to U.S. consumers. The real (inflation-ad-

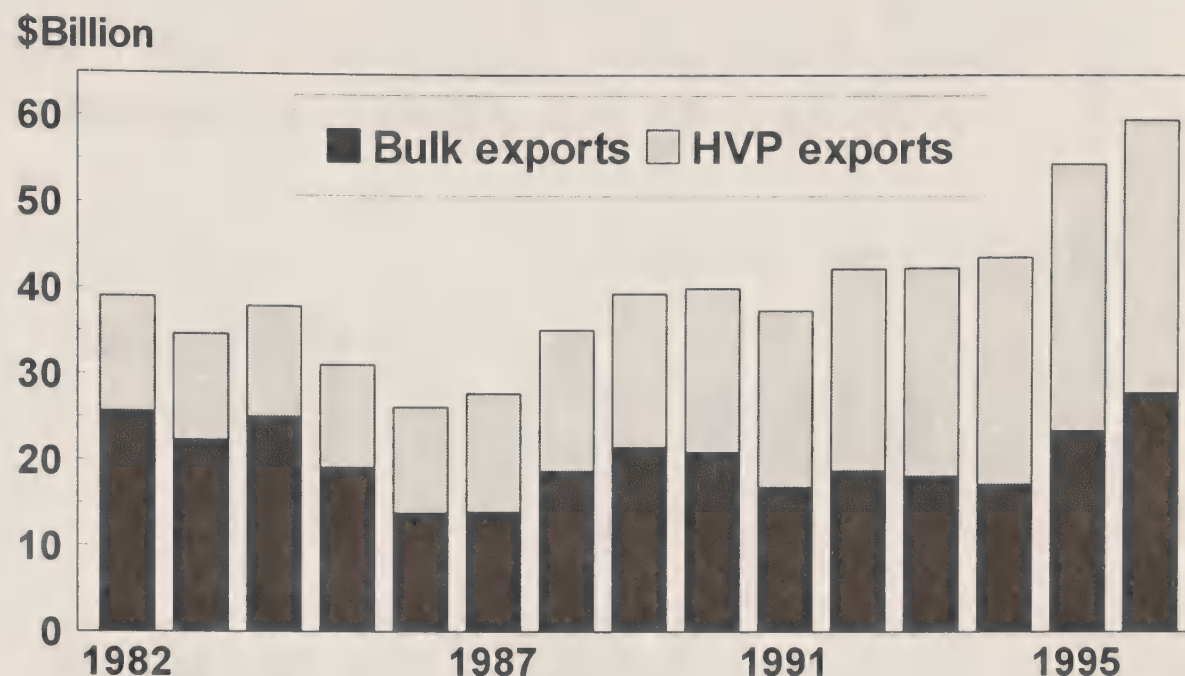
justed) value of U.S. agricultural imports has been relatively stable in recent years, and imports have accounted for about 8 percent of total food consumed in American homes.

French wine and cheese or Italian pasta, and for "off season" fresh fruits and vegetables from Mexico, Chile, and other tropical countries.

U.S. Exports of HVPs Outpace Bulk Commodities

- The value of U.S. agricultural exports was \$60.4 billion in 1996, up from \$56.3 billion in 1995.
- Historically, bulk commodities (grains and oilseeds) accounted for the majority of U.S. agricultural exports. In the last decade, that picture changed. In 1991, high-value products (HVPs)--a category composed of processed foods, intermediate products such as soybean meals and oils, and consumer-ready unprocessed products such as fresh fruits and vegetables and eggs--surpassed bulk goods in export value.
- Export growth in HVPs is in response to growing demand in North America and East Asia where personal incomes are increasing, diets are diversifying, and (in the case of East Asian markets) production capacity (for livestock operations, for example) is very constrained. Although HVP exports are increasing, they tend to be concentrated in relatively few, more affluent markets. For example, major markets for processed food exports (\$15.5 billion in 1995) are Japan, Mexico, and S. Korea. Intermediate product exports

Composition of U.S. Trade Has Shifted



(\$8.6 billion in 1995) went mostly to the European Union and Japan; and consumer-ready unprocessed food exports (\$4.6 billion in 1995) went mostly to Canada, Japan, the European Union, S. Korea, and Hong Kong.

For more information from ERS on U.S. commodity production, use, and trade, see:

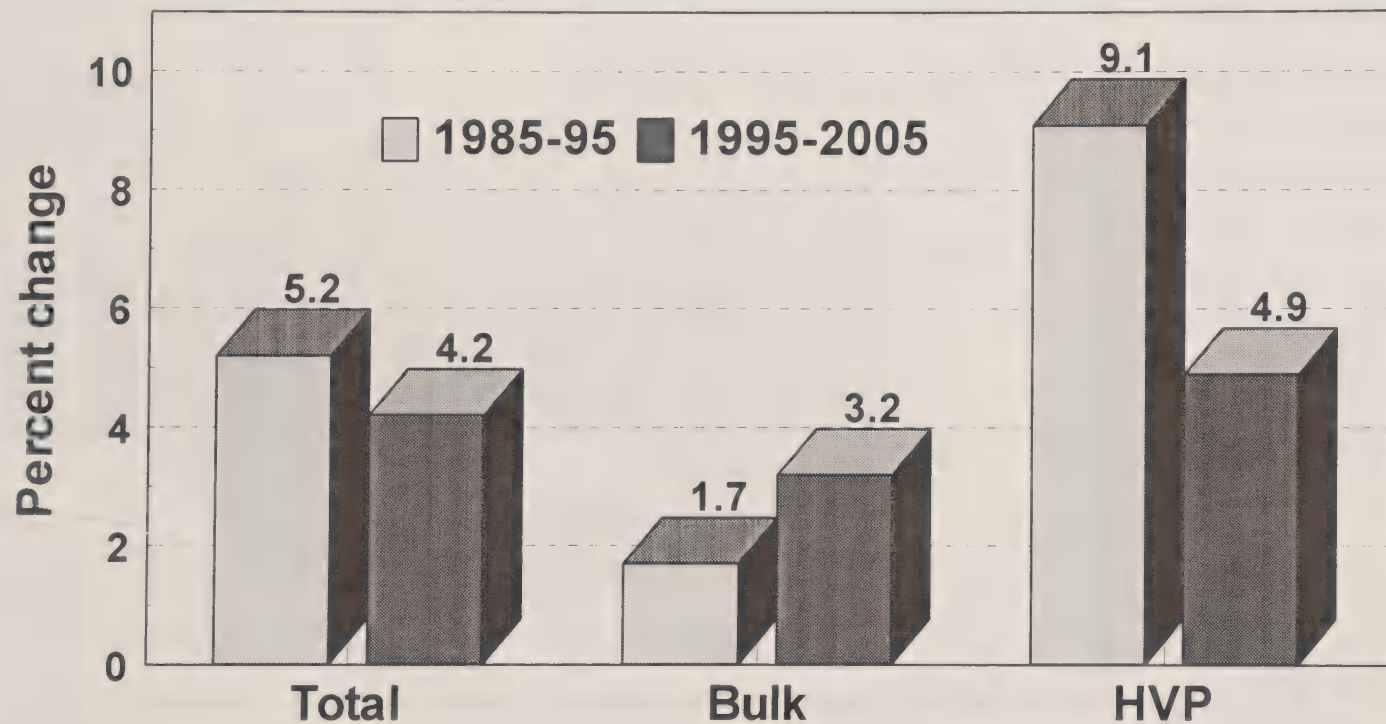
Commodity Situation and Outlook Series

which can be accessed through the ERS Home Page:

<http://www.econ.ag.gov/>

Projected Export Growth Rates Favor HVPs

Though it will slow slightly over next decade, the growth rate of HVP exports will still exceed the rate for bulk products...



- USDA trade forecasts show some slowing in HVP export growth likely, in part because potential gains in market access through bilateral negotiations in East Asian and North American markets cannot now be factored into the forecasts. Still, as personal incomes grow, the composi-

tion of trade will continue to shift toward high value products. HVP exports are expected to increase about 6 percent a year between 1996 and 2005, while bulk commodity exports are expected to increase slightly more than 3 percent a year.

- The strong growth assumed for exports over the next decade is expected to cushion U.S. farmers' incomes as they adjust to a new policy environment created by the 1996 Federal Agricultural Improvement and Reform Act (the 1996 Act).

The Future of U.S. Agricultural Trade

- Global income and population growth are the underlying causes of new and expanding market opportunities. But realizing those opportunities relies on continued gains in reducing existing trade barriers, which remain high in some markets, and on assuring that new forms of trade restrictions, including protectionism within the context of regional agreements, do not proliferate.

- Additionally, global commerce is much more complex than in the past. There is much still to learn about the relationships between the multinational locations of food firms and international trade in food and agricultural products.

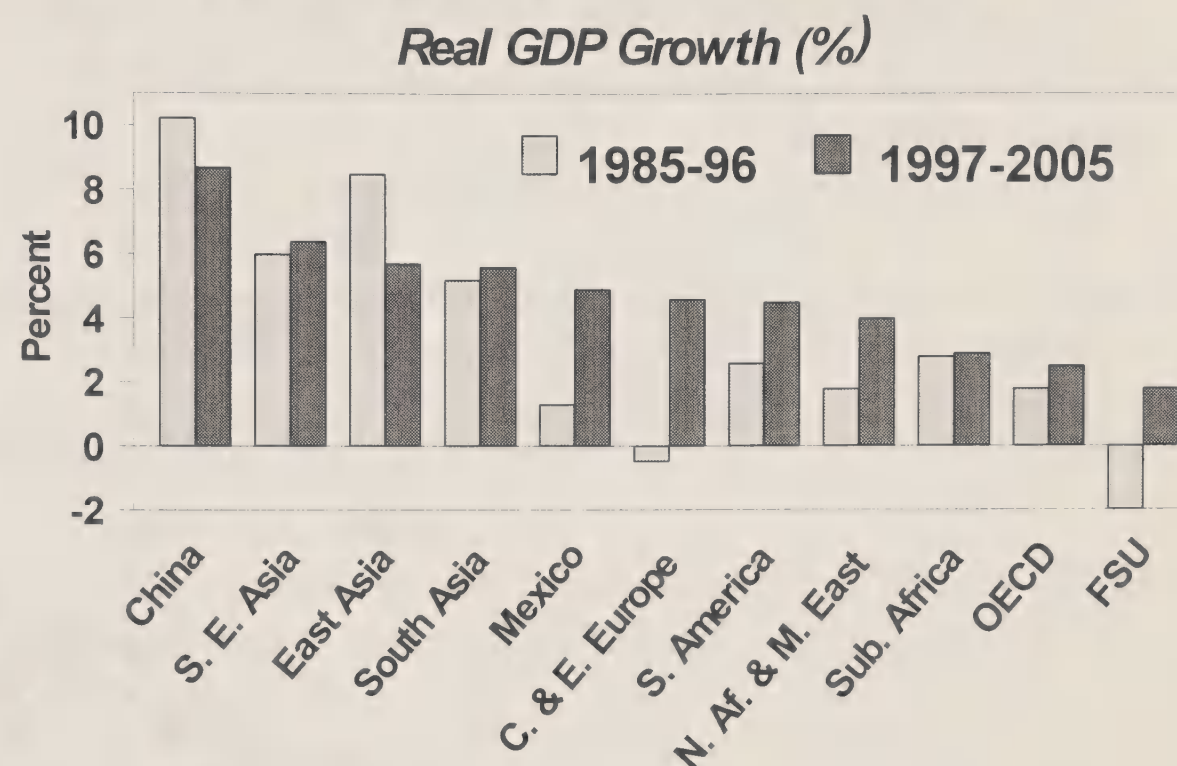
For data from ERS on U.S. agricultural trade:

Foreign Agricultural Trade of the United States

which can be accessed through the ERS Home Page:

<http://www.econ.ag.gov/>

Asia and Other Developing Countries Lead in Forecasts of Economic Growth...



Expanding Markets in Asia

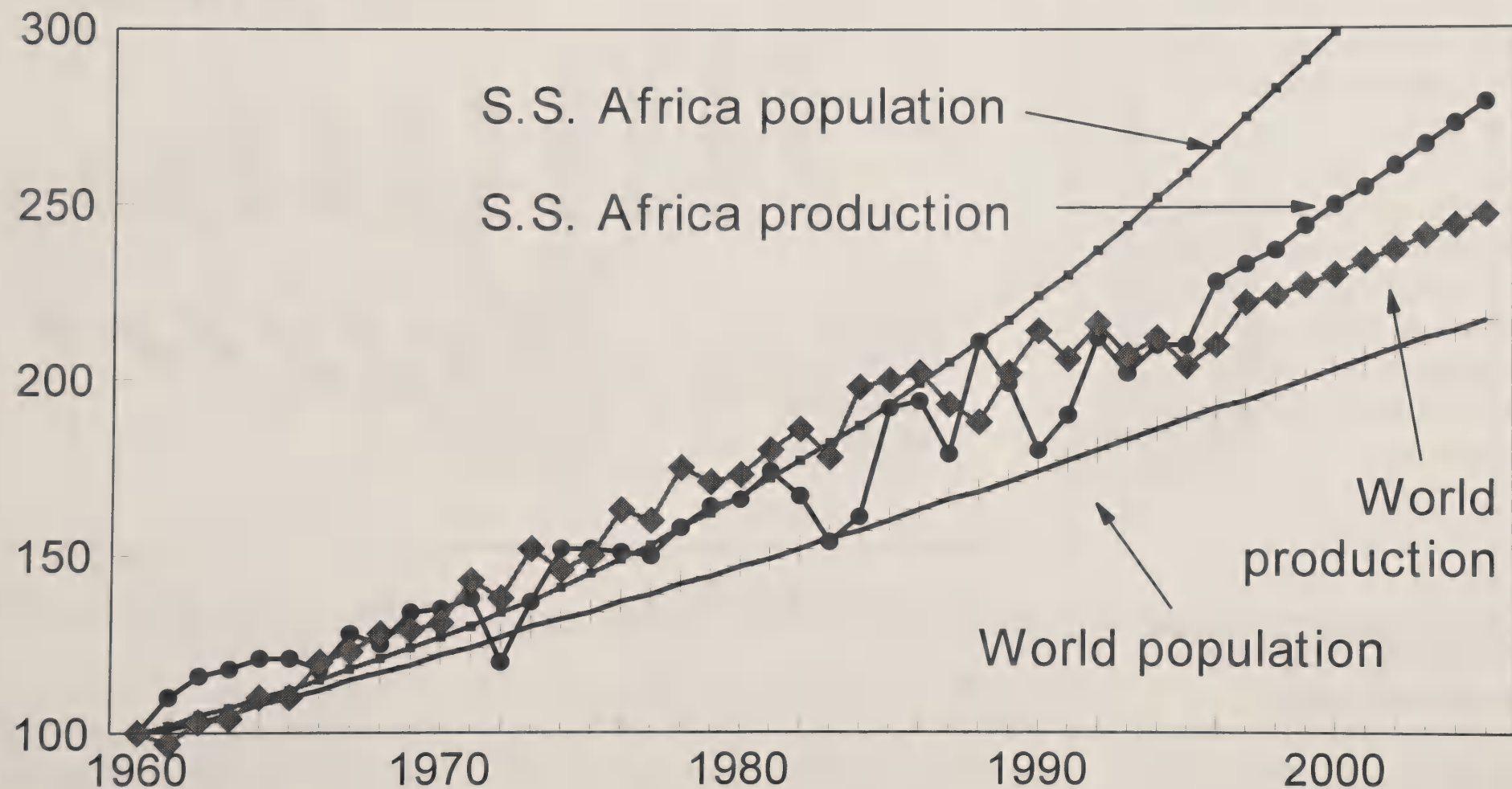
- USDA and other forecasters project strong economic growth throughout much of Asia to continue through the coming decade. Combined with the limited capacity of most Asian countries to expand agricultural production, income growth is likely to translate into increased de-

mand for U.S. as well as other nations' exports.

- The rate of economic growth is expected to improve in most other regions of the world as well, though not at the rates anticipated for Asia.

In Sub-Saharan Africa Population Growth Is Outpacing Gains in Food Production

Index: 1960=100



Source: ERS/USDA baseline analysis

Population Expansion Fuels World Demand and Food Aid Needs

- World population is projected to grow 1.5 percent annually until 2005, sustaining global demand for bulk commodities and food products. However, because global grain production is expected to increase even faster, real commodity prices are expected to continue their long-run downward trend.
- Population is growing most rapidly in the lowest income countries, such as those of Sub-Saharan Africa, where agricultural productivity gains are lagging population growth. USDA forecasts that the gap between population growth and food production growth in Sub-Saharan Africa will expand food aid needs rather than commercial exports. This is because of the continuing slow rates of economic development and low levels of personal income.

Suggested reading:

Food Aid Needs Assessment: Situation and Outlook Series, USDA, Economic Research Service, November 1996.

The Uruguay Round Produced Results

- The Uruguay Round of the General Agreement on Tariffs and Trade established rules and commitments for agricultural trade
- "Disciplines" were established for:
 - *Market access*
 - all non-tariff barriers were converted to tariff equivalents
 - all tariffs must be reduced by 36 percent on average
 - guarantees of minimum market access were granted
 - *Domestic support*
 - *Export subsidies*
 - volume must be reduced by 21 percent, value by 36 percent
 - commodity coverage was fixed

The Uruguay Round Produced Results

- Both the Uruguay Round agreements and NAFTA are vitally important to U.S. agriculture. The Uruguay Round was especially key in establishing frameworks for ongoing efforts to lower trade barriers and expand market access worldwide.

- Although the near-term quantitative effects may be modest, the Uruguay Round's conversion of nontariff barriers to tariffs is a major accomplishment with the potential to bring greater transparency to agricultural trade policies and facilitate future reductions of import barriers.

High Tariffs Remain in Many Markets, Particularly for High-Value Products (HVPs)

Selected bound tariff rates in 2000

Japan		Korea		EU		Canada	
Beef	38 %	Beef	41 %	Beef	152 %	Wheat	76 %
Cheese	30 %	Cig.	40 %	Rice	185 %	Butter	299 %
O. Juice	26 %			Wheat	102 %	Chicken	238 %
				Butter	218 %		

- Trade-distorting domestic support, such as market price support, is also reduced by the Round. But farm-sector support considered non- or minimally trade distorting, such as publicly funded agricultural research, extension, inspection, infrastructure, and food security stocks, as well as crop insurance and decoupled income payments, need not be reduced.

- Disciplines on export subsidies, which have been used most heavily by the European Union and the United States, were a major accomplishment of the Round.

Some Problems Were Left Unsolved By the Uruguay Round...

- Some countries pursued "dirty tariffication." This means that new, bound tariff rates were much higher than pre-Round levels of protection implied by nontariff barriers. Additionally, agricultural tariffs remain generally much higher than tariffs in other sectors of the economy. This is true for the United States and many other nations.

- In the European Union, for example, tariff bindings were higher than 1994 protection levels in six of the seven major agricultural product groups. Tariff offers for wheat exceeded historical tariff equivalents in India (by 98 percent), Pakistan (by 171 percent), and Morocco (by 21 percent).

- Additionally, although cuts in export subsidies were meaningful, agriculture is the only sector in which export subsidies remain permissible. Some other forms of export assistance, such as export credits and credit guarantees, food aid assistance, and market promotion programs, could potentially become the source of trade friction.

- The UR did little to address issues associated with the use of state trading (single-desk buying and selling agents) in agriculture. There is concern that some state traders use selective price cutting schemes, are unfairly subsidized by governments, or may exercise monopsonist power.

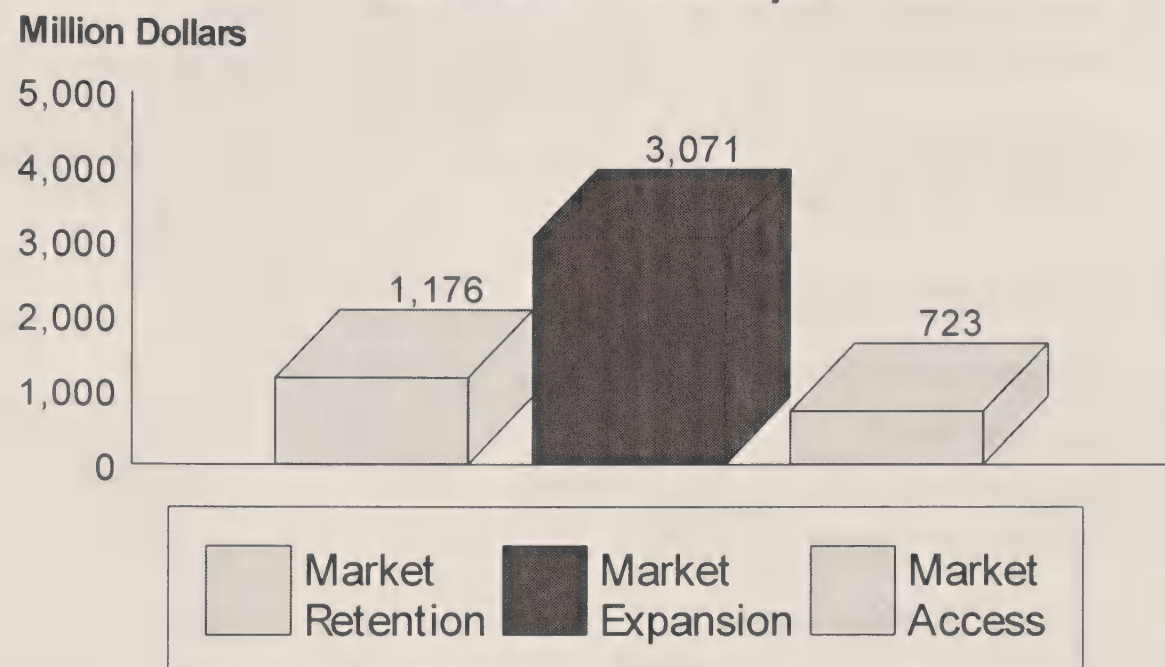
... And Other Trade Policy Issues are Emerging

- The Uruguay Round Agreement on Sanitary and Phytosanitary Measures allows nations to use border measures to protect human, animal, or plant life or health; however, the use of these measures must be justified by objective scientific evidence. The Standards Code covers technical regulations on general food labeling, nutrition, and packaging. These regulations cannot be applied as a disguised restriction on international trade. There is concern, however, that as traditional trade barriers are lowered, sanitary and phytosanitary measures and technical regulations will be used as protection devices.

- A 1996 survey of USDA's Foreign Agricultural Service posts estimated that \$5.5 billion of U.S. agricultural exports are affected by "debatable" sanitary, phytosanitary,

Technical Barriers Threaten, Constrain, and Block U.S. Agricultural Exports

Estimated Trade Impact



and other technical barriers to trade. This includes \$1.8 billion of "threatened" trade, \$2.9 billion of "constrained" trade, and \$695 million of prohibited trade. Compared to \$60.4 billion of total U.S. agricultural exports in 1996, these impediments do not presently represent a serious hindrance.

Suggested reading:

Krissoff, Barry, Nicole Ballenger, John Dunmore, and Denice Gray. *Exploring Linkages Among Agriculture, Trade, and the Environment: Issues for the Next Century*, Agricultural Economic Report 738, USDA, Economic Research Service, May 1996.

Western Hemisphere Markets Account for a Quarter of Total U.S. Exports

Issues:

- ▶ Improved 1995-2005 growth prospects
- ▶ Subregional pacts Impede U.S. access

Focus on Latin America ...

- ▶ Agricultural imports: \$ 10.7 billion
- ▶ Share of world: 3.3%
- ▶ Imports from U.S.: \$ 2.7 billion
- ▶ U.S. market share: 24.8%

(1991-93 averages)



Regional Pacts and Trade in Agriculture

North and South America

- The numerous subregional pacts of the Americas include NAFTA, the Group of Three (Mexico, Venezuela, and Columbia), CARICOM, MERCOSUR (Brazil, Paraguay, Uruguay, and Argentina), the Andean Group, the Central American Common Market, a number of bilateral agreements between Chile and other countries, and the Association of Caribbean States.

- There is some concern that movement toward subregional pacts may have adversely affected U.S. trade. MERCOSUR, for example, may have reduced U.S. exports to Brazil in the 1990s because MERCOSUR tariffs on Argentine goods are lower than tariffs on U.S. goods. Future agreements could form between NAFTA and Chile, NAFTA and MERCOSUR, MERCOSUR and the Andean Pact, and others.

- Subregional pacts can create trade over the longer run if they stimulate economic growth, so the net effect of subregional pacts in the

- Plant health regulations appear to be the most important technical barrier to U.S. agricultural exports, followed by food safety standards, and quality standards. Labeling requirements are also important.

followed by horticultural products, then livestock and meat products. Technical barriers are most pervasive in East Asia, with an estimated \$2.3 billion of U.S. trade expansion potential affected.

- Processed food exports are most likely to be constrained by "debatable" technical barriers to trade,

Western Hemisphere remains an empirical question and an area for research.

Asia

- The Asia-Pacific Economic Cooperation (APEC) forum of 18 members bought \$33 billion of U.S. exports in 1995. Seven markets (Japan, Canada, Mexico, South Korea, China, Taiwan, and Hong Kong) accounted for 90 percent of these sales. Expanding middle class populations, lowered trade barriers, and the weak dollar favored U.S. trade exports to these countries.

- In Asia, Indonesia, Thailand, Malaysia, and the Philippines are rapidly expanding U.S. export markets (up 140 percent from 1990-1995) as is China. This is because of large and expanding populations, strong economic performance, and per capita income levels at which per capita food consumption is still growing.

- Rising incomes, land scarcity, increased market access, and the westernization of diets have benefited U.S. exports to Japan, South Korea, Taiwan, and Hong Kong, particularly of consumer-ready and processed food products.

Nations of the Asia-Pacific Economic Cooperation Forum (APEC) Accounted for More Than 60 Percent of U.S. Exports in 1995



Issues:

- The fastest growing region of the world
- Includes a number of large emerging markets

Focus on Asian members of APEC...

Total imports:	\$81.0 billion
Share of world:	26.4%
Imports from U.S.:	\$16.5 billion
U.S. market share:	20.4%

(1991-93 averages)

For U.S. trade with Asia and the Western Hemisphere, see the Situation and Outlook Series on:

***APEC Agriculture and Trade
NAFTA Agriculture and Trade***

on the ERS Home Page:
<http://www.econ.ag.gov/>

Suggested reading:

Wang, Zhi. *The Impact of China and Taiwan Joining the World Trade Organization on U.S. and World Agricultural Trade: A Computable General Equilibrium Analysis*, Technical Bulletin 1858, USDA, Economic Research Service, May 1997.

EU Enlargement and CAP Reform

- While there is no firm timetable, Poland, Hungary, the Czech Republic and Slovakia could become members of the European Union as soon as 2000.

- Membership in the EU means that the EU will have preferential

access to the markets of the Central and Eastern European Countries (CEEs), and vice versa. It also means CEE trade barriers will rise vis-a-vis the U.S. and other non-EU countries, which could divert some U.S. trade.

- However, extending the EU's protective Common Agricultural Policy to the CEE countries, which have

large agricultural sectors in the midst of structural reform, could lead to prohibitive budgetary costs and exacerbate costly surpluses in some commodities. Thus, some speculate the EU could be forced to make changes in the CAP, such as further reducing support prices.

EU Enlargement Could Accelerate Reform of Common Agricultural Policy

- EU-15 has entered into association agreements with Central and Eastern European states
- The U.S. sends \$9.3 billion in agricultural products to the EU
- U.S. agricultural exports to CEEs are in excess of \$400 million



For more information from ERS on U.S. trade with Europe, the Newly Independent States, and the Baltics, see...

International Agriculture and Trade Report: Europe

International Agriculture and Trade Report: Newly Independent States and the Baltics

Both can be accessed through the ERS Home Page:

<http://www.econ.ag.gov/>

Growth in Grain Demand from China

- The USDA forecasts that China's total grain imports will rise from about 17 million tons now to about 33 million tons in 2005, making it the largest grain importer in the region. This projection contrasts sharply with that of the WorldWatch Institute (WW) and is in line with others'.

- The ERS projections assume meat will continue to displace grain in the Chinese diet, grain production will expand but more slowly than consumption, and that higher grain yields are forthcoming.

- Scope for higher yields exists because under-reporting of land means that yields have been overstated. Also, greater application of higher yielding seeds, better management, and increased use of other inputs are anticipated, as well as more multiple cropping.

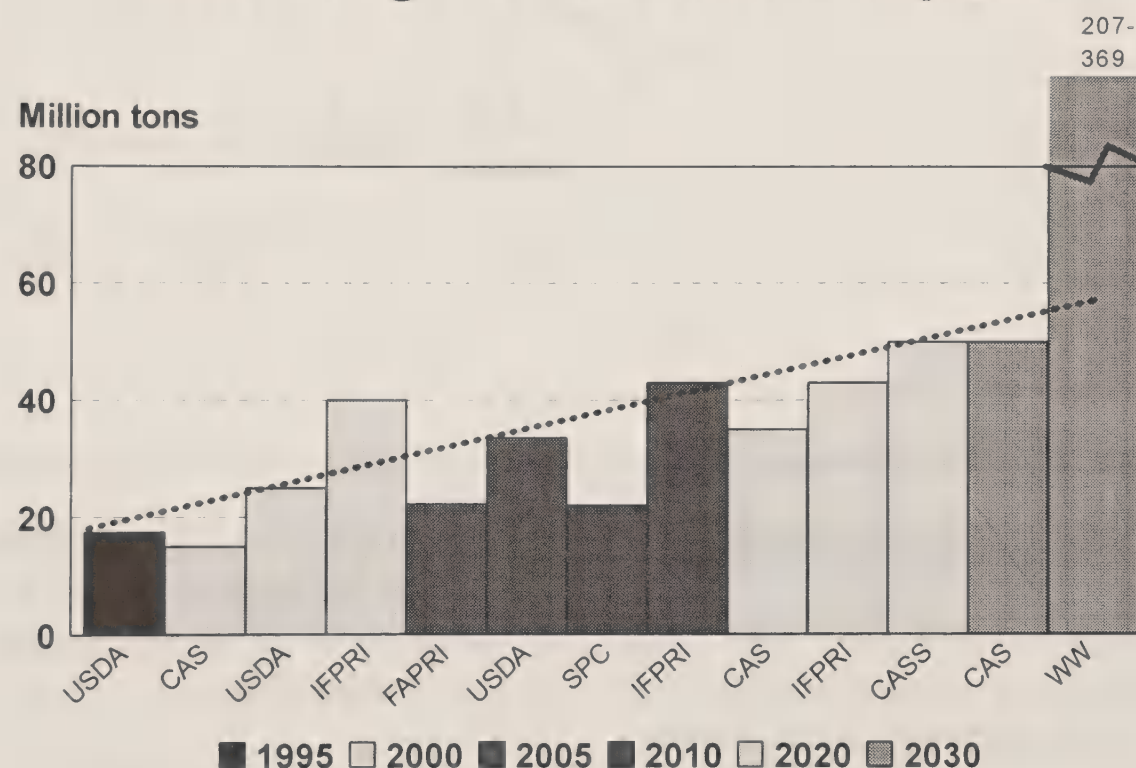
- Uncertainties related to trade with China include its commitment to the world trading system, government

policy regarding the importation of "luxury" goods such as meats and feed grains, and the capacity of China's trade infrastructure such as port capacity and grain handling facilities.

Suggested reading:

Crook, Fred and Hunter Colby. *The Future of China's Grain Market*, AIB-730, USDA, Economic Research Service, October 1996.

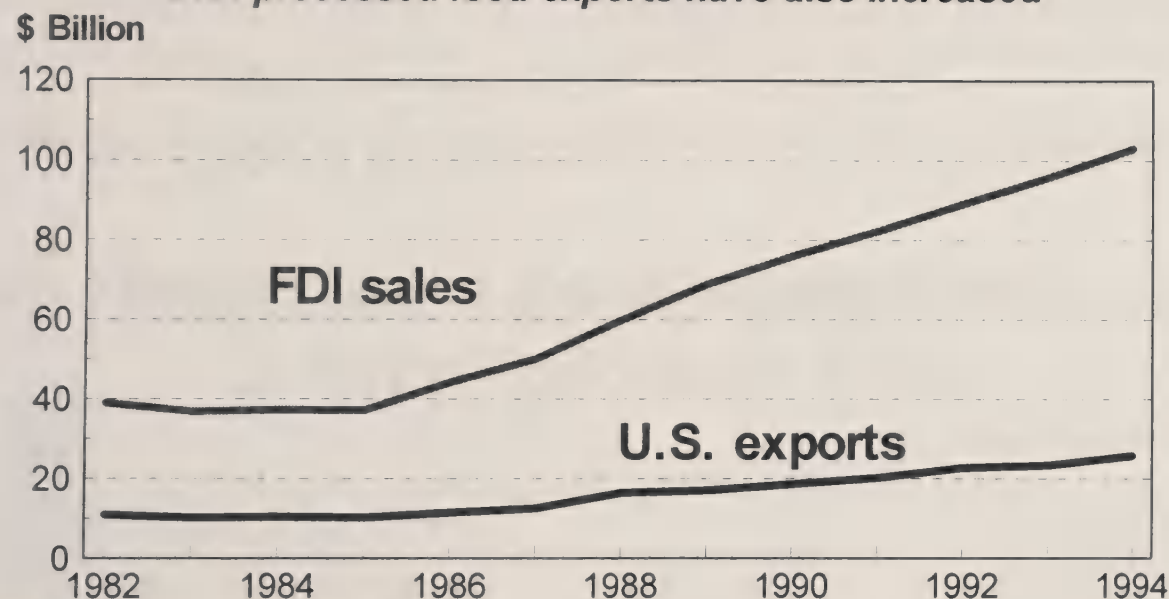
Predicting China's Grain Imports



USDA = U.S. Department of Agriculture CAS = China's Academy of Sciences IFPRI = International Food Policy Research Institute
FAPRI = Food and Agricultural Policy Research Institute SPC = China, State Planning Commission CASS = Chinese Academy of
Social Science WW = Worldwatch Institute

FDI Sales of Processed Foods Exceed U.S. Exports of Processed Foods

While FDI sales of U.S. food firms have tripled in the last decade, U.S. processed food exports have also increased



stayed in the host country. Only 2 percent made it back to the U.S. as imports. The remaining 19 percent was exported from the host country to third-country markets.

- FDI sales are four times greater than U.S. exports of processed foods, and growing rapidly. They nearly tripled in the last 10 years. There is growing interest in understanding location and sourcing decisions by multinational food firms, and the relationships between FDI sales by U.S. firms and exports of U.S. agricultural products: for example, are FDI sales substituting for exports of processed foods?

Suggested readings:

Neff, Steve. "Globalization of the Processed Foods Market," Agricultural Economic Report 742, USDA, Economic Research Service, October 1996.

Ruppel, Fred. "U.S. Trade in Processed Foods," and Bolling, Christine, Charles Handy, and Steve Neff. "Foreign Affiliates of U.S. Food Firms," *Agricultural Outlook*, USDA, Economic Research Service, January/February 1997.

Foreign Direct Investment

- Foreign direct investment (FDI) has become a key component of U.S. food manufacturing firms' strategies in the world market. FDI gives firms more control over production, quality, distribution, and marketing of their product. Six of the ten largest multinational food manufacturing or distri-

bution firms are U.S. in origin, as are 21 of the 50 largest. U.S. FDI abroad is twice as large as FDI investments in the United States.

- U.S. firms locate food processing plants in foreign countries primarily to sell in the host country market. Seventy-nine percent of total FDI sales of U.S. food firms in 1993



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